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Further Observations on the Laboratory Diagnosis of Aseptic Meningitis caused by Group B Coxsackie Virus*

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IT is now established that Coxsackie B virus is an important cause of aseptic meningitis, clinically similar to nonparalytic poliomyelitis. Until recently, this evidence was indirect and was based on isolation of Coxsackie B virus from the stools of patients, serological evidence of infection with the strain recovered, and failure to demonstrate infection with poliomyelitis, mumps, or other viruses (*5*, *14*). This evidence was the more significant because the virus has rarely been recovered from the general population (*12*, *13*). More recently, the direct isolation of Coxsackie B virus from the cerebrospinal fluid of several cases of aseptic meningitis has firmly established the aetological role of this agent (*4*, *6*, *7*, *8*).

During 1952, cases of aseptic meningitis diagnosed clinically as "nonparalytic poliomyelitis" admitted to The Hospital for Sick Children, Toronto, were subjected to an intensive clinical and virological study, already described in two reports (2, 4). The first paper reported the isolation of Coxsackie B virus in suckling mice from the stools of 14/33 of the patients (*2*). Poliomyelitis virus was isolated from only six of the 33 patients in monkeys or "Maitland" type tissue cultures. In the tissue culture studies, stools were first inoculated in "Maitland" type cultures of minced monkey testis; fluid changes were made twice weekly, and the later changes subinoculated into fragment cultures of monkey testis. The second paper (*4*) recorded the isolation in monkey kidney

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"monolayer" cultures of Coxsackie B viruses from the cerebrospinal fluid of three of the group of 33 patients, and "unidentified" viruses from the spinal fluid of two patients.

Monkey kidney monolayer cultures are more sensitive to poliomyelitis virus than the methods reported in our first study. They are also sensitive to Coxsackie B virus (*15*). Titrations for antibodies to both these viruses may be readily performed in monolayer cultures. It seemed desirable, therefore, to re-examine the specimens obtained from the patients originally studied in 1952, to determine the type of Coxsackie B viruses and to see if additional Coxsackie or poliomyelitis viruses could be isolated. In addition the poliomyelitis and Coxsackie B neutralizing antibody levels in the sera of patients excreting Coxsackie B were determined. This additional material is now reported, to form the third paper of the series describing studies on cases of aseptic meningitis seen in Toronto in 1952. It is planned, additionally, to report on the study of the clinical features of approximately 20 cases of Coxsackie B meningitis studied in Toronto 1950–1955.

Methods

Study in 1952

During the 1952 poliomyelitis season in Toronto, there was an unusual preponderance of nonparalytic cases, the ratio of nonparalytic to paralytic being 3:1. Stools and cerebrospinal fluids were collected from a group of 33 patients admitted to The Hospital for Sick Children, Toronto, with a diagnosis of "aseptic meningitis, probably nonparalytic poliomyelitis". Acute and convalescent sera were obtained from most patients. All the specimens were stored in a solid carbon dioxide freezing box. Stool extracts and cerebrospinal fluid were inoculated intracerebrally into suckling mice, monkeys, and monkey testis "Maitland" type tissue cultures as previously reported (*2*).

Present Study

Tissue Cultures: Monkey kidney monolayer cultures were prepared from cell suspensions obtained by trypsin extraction of minced monkey kidney, essentially as described by Youngner (*16*). Cell sheets were grown in Medium 199 containing 1 to 2% horse serum (*10*); before infection of the cultures, the nutrient was changed to plain Medium 199. Penicillin (500 units per ml) and streptomycin (250 micrograms per ml) were added to all media.

Isolation of Viruses: The stool extracts were either a "medium speed supernatant" (MSS) obtained after centrifuging a 10% suspension of stool at 10,000 rpm for 30 minutes, or an "ultracentrifuged deposit" (UCD) obtained by centrifuging the MSS at 40,000 rpm for 1 hour in a "Spinco" ultracentrifuge, the deposit being resuspended in about 2 ml of saline. The preparations had been stored at —20°C since the previous study in 1952.

Groups of three or more monkey kidney monolayer cultures were inoculated with 0.1–0.5 ml of MSS or UCD, and were then examined daily under the low power of the microscope for cytopathogenic changes. Cultures which remained normal in appearance were kept for a week, and the culture fluids were then subinoculated into fresh cultures which were observed for a further week.

Identification of Poliomyelitis Viruses: The typing of poliomyelitis viruses

was performed as described previously (3). Tissue culture fluid containing the virus to be typed was mixed with an equal volume of poliomyelitis hyperimmune monkey antiserum. In order to assign the strain to a specific type, and to detect the presence of more than a single type, four parallel tests were made with sera to each of the three types of poliomyelitis virus, and with a mixture of these type specific antisera. After the virus serum mixtures had stood for one hour at room temperature, 0.1 ml amounts were inoculated into groups of two or three cultures. The results were read one week later, under the low power of the microscope.

Identification of Coxsackie Viruses: Those agents isolated in tissue culture, which were not neutralized by type specific poliomyelitis antisera or by a mixture of these sera, were inoculated intracerebrally into one day old suckling mice to test for pathogenicity. Tissue culture fluids which killed mice with features suggestive of Coxsackie infection were then inoculated in groups of monkey kidney cultures containing antisera to the B Types 1, 2, 3, and 4. This test enabled the causal type of Coxsackie B virus to be identified.

The viruses that still remained unidentified were tested in monkey kidney monolayer cultures against a mixture of antisera to the three poliomyelitis and Coxsackie B4 viruses.

Serological Studies: Acute and convalescent phase sera were tested together for antibody to strains representative of the three poliomyelitis virus types (Mahoney, MEF 1, Saukett) and, where applicable, to the Coxsackie B4 strain isolated from the stool. These tests were made by mixing serial dilutions of patients' serum with an equal volume of virus suspension containing 100 TCD_{50} of virus, and inoculating groups of 5 culture tubes with each dilution. The results were read after one week, and the titre expressed as the final dilution of serum that neutralized virus in 50% of the cultures.

Results

Virus Isolations

The stools from 33 cases of aseptic meningitis seen in 1952 have now been examined by intracerebral inoculation of monkeys and suckling mice and by inoculation of monkey testis suspended cell cultures and monkey kidney monolayer cultures. The results of all these isolation tests are summarized in Table 1. The reference numbers of the patients are those used in the previous reports.

It will be seen from Table 1 that 14 strains of Coxsackie B virus were originally isolated in suckling mice inoculated with stools (patients 7, 11, 12, 17, 22, 31; 6, 14, 32; 18, 24; 21; 8; 13). All these strains, with the exception of 21, were also isolated in monkey kidney monolayer cultures on the subsequent examination in 1954. In contrast, only seven strains were originally isolated in monkey testis suspended cell cultures (7, 11, 12, 17, 22, 31; 8). As previously reported (4), four patients (8, 13, 14, 22) yielded Coxsackie B virus from cerebrospinal fluid; these strains were all isolated in monkey kidney monolayer cultures despite original negative tests in suckling mice.

All the 13 Coxsackie B viruses that grew in monolayers inoculated with stool were typed in monolayer cultures and found to belong to Type 4. The typing results for six of these strains (6, 8, 13, 14, 17, 22), were kindly con-

firmed for us by Miss Grace Sickles and Doctor Gilbert Dalldorf at the New York State Laboratories, Albany, N.Y. In addition, these workers typed the four strains isolated from the cerebrospinal fluid and found that they also belonged to Type B4.

The virus from patient 21 was found to be Type 4 by serological typing in mice. Four Coxsackie A strains were isolated in suckling mice (15, 16, 28, 20). Two of these (15, 16) were also recovered in suspended cell cultures, but none of them in monkey kidney monolayers.

Only six poliomyelitis strains were isolated; all the patients concerned were also excreting Coxsackie virus in their stools (18, 24, 21, 8, 13, 20). Two of these patients (18, 24) yielded Coxsackie B virus in suckling mice and monolayers as well as poliomyelitis virus Type 1 in monkeys, suspended cell cultures, and monolayers. Patient 21 yielded Coxsackie B in suckling mice only; Type 1 poliomyelitis virus was isolated in suspended cell and monolayer cultures.

Patient 8 yielded Coxsackie B virus in suckling mice and both types of culture. Poliomyelitis virus was not recovered in culture, but monkey 866 showed histological changes interpreted in 1952 as indicating poliomyelitis; the animal was not sick and was killed 4 weeks after inoculation. Incidentally, in 1952 this patient was reported as excreting an "orphan" virus in stools; this strain has now been identified as Coxsackie B4.

Patient 13 excreted Coxsackie B virus which infected suckling mice and monolayers. No poliomyelitis virus was isolated in either type of tissue culture. However, inasmuch as monkey 869 was paralyzed and showed typical histology, the co-existence of poliomyelitis virus must be accepted.

Patient 20 yielded Coxsackie virus Group A in suckling mice and poliomyelitis virus only in monkeys. Monkey 773 was not paralyzed but showed histological evidence of poliomyelitis infection when killed after one month.

To summarize the results in the six patients from whose stools both poliomyelitis and Coxsackie viruses were isolated, the co-existence of Type 1 poliomyelitis and B4 Coxsackie was definitely proven in three patients (18, 24, 21). In a fourth patient (13) the poliomyelitis virus present was detected only in monkeys and was not typed. In a fifth patient (8) excreting Coxsackie B, the only evidence for co-existence of poliomyelitis is a single histological report. In the sixth patient (20) Coxsackie A virus was identified, and the only evidence for the co-existence of poliomyelitis virus was the histological report on the monkey.

A total of eight "orphan" viruses were isolated. Three of these (10, 26, 30) were recovered both in monkey testis suspended cell cultures and monkey kidney monolayers. Five strains (1, 2, 5, 27, 29) were isolated only in monkey kidney monolayer cultures. The eight strains were not pathogenic for suckling mice, and were not neutralized by Coxsackie B sera 1–4, or by a mixture of Coxsackie B4 and the three poliomyelitis Type antisera.

Miss Sickles and Dr. Gilbert Dalldorf kindly examined four of these strains (2, 5, 27, 29) and reported that they were not neutralized by antisera to poliomyelitis virus Types 1, 2 or 3, nor by sera to Coxsackie virus Types A9, B1, 2, 3, 4, 5 and "Bolen No. 54262".

Seven of the 33 patients did not yield a virus by any of the tests performed on stools (3, 4, 9, 19, 23, 25, 33).

TABLE 1

"NON PARALYTIC POLIOMYELITIS" TORONTO 1952: ISOLATION OF VIRUSES FROM STOOLS OF 33 CASES

Ref. No. of Patients	Tests Performed in 1952					Tests Performed in 1954–55		
	Tests for Coxsackie Virus		*Tests for Poliomyelitis Virus*			Viruses Isolated in Monkey Kidney Monolayers		
	in Suckling Mice (intracerebral)	in Suspended Cell Cultures (monkey testis)	in Monkeys (intracerebral)	in Suspended Cell Cultures (monkey testis)	Tests for "Orphans" in Suspended Cell Cultures (monkey testis)	Coxsackie	Polio	"Orphans"
Coxsackie virus isolated								
7, 11, 12, 17, 22*, 31	Group B	Group B	—	—	—	Group B, Type 4	—	—
6, 14*, 32	Group B	—	—	—	—	Group B, Type 4	—	—
15, 16	Group A	Group A†	—	—	—	—	—	—
28	Group A	—	—	—	—	—	—	—
Poliomyelitis and Coxsackie virus isolated								
18, 24	Group B	—	+	Type 1	—	Group B, Type 4	Type 1	—
21	Group B	—	—	Type 1	—	—	Type 1	—
8*	Group B	Group B†	+	—	—	Group B, Type 4	—	—
13*	Group B	—	+	—	—	Group B, Type 4	—	—
20	Group A	—	+	—	—	—	—	—
Orphan virus isolated								
5**, 10, 26, 30	—	—	—	—	+	—	—	+
1, 2, 27**, 29	—	—	—	—	—	—	—	+
Negative								
3, 4, 9, 19, 23, 25, 33	—	—	—	—	—	—	—	—

*Coxsackie B4 virus also isolated in monkey kidney monolayer cultures from the cerebrospinal fluid (*5*).

**An orphan virus was isolated in monkey monolayer cultures from the cerebrospinal fluid.

†These strains were originally reported as unidentified agents (*3*) but have subsequently been shown to be Coxsackie viruses.

In summary, therefore, no additional poliomyelitis viruses were isolated from stools by the additional inoculation of monkey kidney monolayer tissue cultures. Thirteen of the fourteen Coxsackie B4 viruses originally isolated in mice were recovered by inoculation of monolayers. Five additional orphan viruses were detected in monolayers.

Serology

Acute and convalescent serum samples from 10 of the 14 patients excreting Coxsackie B4 virus, with or without poliomyelitis virus, were tested for antibodies to the three Types of poliomyelitis virus and to the homologous Coxsackie B virus isolated from stools. The results are presented in Table 2. It will be seen that six of the seven patients who were excreting only Coxsackie B4 virus showed a rise in titre to the strains isolated from their stools (6, 7, 11, 14, 22, 32). The remaining patient (17) had a high titre in both specimens.

TABLE 2

SEROLOGICAL STUDIES ON TEN PATIENTS EXCRETING COXSACKIE B4 VIRUS IN STOOL

Reference No. of Patients	Days after Onset Serum Collected		Titre of Antibody to Coxsackie B4 Virus*		Titre of Antibody to Poliomyelitis Virus*					
					Type 1		Type 2		Type 3	
	S_1**	S_2**	S_1	S_2	S_1	S_2	S_1	S_2	S_1	S_2
Coxsackie B4 only Isolated										
6	1	33	2.4†	4.1†	<1.3	<1.3	2.0	2.1	1.8	1.8
7	3	36	1.9†	3.1†	<0.3	<0.3	<0.3	<0.3	2.8	3.2
11	3	39	0.3	1.9	<1.3	<1.3	2.8	2.4	1.8	1.8
14	0	35	0.2	2.2	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
17	1	34	2.1†	2.1†	<0.3	<1.3	<0.9	<0.8	1.8	1.8
22	4	36	1.8	2.5	<0.3	<1.3	<0.3	<1.3	1.6	1.6
32	2	38	2.0	3.0	<0.3	<0.3	2.5	2.7	2.5	2.7
Poliomyelitis and Coxsackie B4 Isolated										
8	3	39	1.6	3.0	<1.3	<1.3	2.0	2.0	<1.3	<1.3
18††	6	29	0.4	1.2	2.4	3.6	<0.3	<0.3	<0.3	<0.3
21††	6	39	0.4	1.4	2.8	3.0	<0.3	<1.3	<0.3	<1.3

*Expressed as the negative logarithm of the 50% neutralizing titre in terms of final dilution of serum.
**S_1 is the acute phase, and S_2 the convalescent phase serum.
†Titrations for Coxsackie antibodies performed in mice.
††Type 1 poliomyelitis virus isolated from stool.

None of these patients showed a significant rise in titre to any Type of poliomyelitis virus. Only a small amount of serum was available from patient 14. No antibody was detected at the dilutions tested. Patients 7, 17, and 22 had antibodies of similar titre in both samples to Type 3 poliomyelitis virus. The other three patients (6, 11, 32) had antibodies to more than one Type of poliomyelitis virus.

Three patients (8, 18, 21) who excreted both poliomyelitis and Coxsackie viruses, all showed a rise in titre to homologous Coxsackie B4 virus. Patient 8 had a high titre to Type 2 poliomyelitis virus in both samples. Patient 18, who

excreted Type 1 virus, showed a rise in titre to the stock strain of Type 1 virus. Patient 21, who also excreted Type 1 virus, had a high titre to Type 1 virus in both samples of serum.

Discussion

Tissue culture techniques have proved of great value in elucidating the aetiology of aseptic meningitis. In this study, 13/14 strains of Coxsackie B4 virus which were originally isolated in suckling mice were re-isolated in monkey kidney monolayer cultures, on examination two years later. Maitland type tissue cultures, on the other hand, were much less sensitive, detecting only 7/14 B strains. Nevertheless, monkey kidney monolayer cultures may in fact be more sensitive than suckling mice because all of the isolations from the cerebrospinal fluid previously reported were made in these cultures after failure in suckling mice.

One of the objects of the present study was to discover if any cases of true nonparalytic poliomyelitis had been missed in our earlier studies (*2*). In fact, no additional poliomyelitis viruses have been isolated. The serological results on the cases excreting Coxsackie B4 virus, whilst not entirely ruling out poliomyelitis infection, were in no case diagnostic of poliomyelitis.

In five patients, the laboratory data suggested dual excretion of Coxsackie B4 and poliomyelitis viruses. In three cases (18, 21, 24) dual excretion with both viruses must be considered proved beyond reasonable doubt. In only three of these five cases of double excretion were serological tests performed. Two patients excreting Type 1 poliomyelitis and B4 Coxsackie showed serological evidence of infection with both viruses (Table 2).

Dalldorf (*1*) has recently reviewed the evidence that Coxsackie B viruses exert an interfering effect on poliomyelitis infection both in laboratory experiments and in human epidemics, noting that the isolation of Coxsackie B and poliomyelitis viruses from a single stool specimen is a rare event. However, Kirby and Evans (*9*) report a patient with aseptic meningitis who excreted Coxsackie B4 and Type 2 poliomyelitis virus in two separate stool samples taken during the course of infection. Our results show conclusively that patients may excrete both viruses in a single stool specimen, and develop antibodies to both viruses. It may be significant that in three out of the five cases one virus was recovered in animals and the other in tissue culture, suggesting there may have been some interfering effect. It may be mentioned that we have never isolated a Coxsackie B virus from the stool of a case of paralytic poliomyelitis. Further studies on the possible interference between Coxsackie B and poliomyelitis viruses under field conditions would be of considerable interest.

In the new study, an additional four unidentified agents were isolated. Two (5, 27) were isolated from the stools and cerebrospinal fluid, and neutralizing antibodies developed during convalescence, so that they must be accepted as the cause of the patients' illnesses (*4*). These agents seem to fulfill the criteria for inclusion in the recently described ECHO group (*11*). Their exact role in human disease remains to be determined, because although most strains have been isolated from cases of aseptic meningitis this probably reflects more the type of case investigated than the true incidence of these viruses.

Summary

1. Stool specimens from 33 cases of aseptic meningitis studied in 1952 were re-examined in 1954–55 by inoculation of monkey kidney monolayer cultures, and three strains of poliomyelitis Type 1, thirteen strains of Coxsackie B4 virus, and eight unidentified viruses were isolated on the re-examination.
2. These results were compared with those previously obtained by the inoculation of monkeys, suckling mice, and monkey testis suspended cell (Maitland-type) cultures. No additional poliomyelitis or Coxsackie viruses were isolated by the new tests, but four additional orphan viruses were recovered.
3. Five patients were found to excrete both poliomyelitis and Coxsackie B viruses in their stools.
4. All the Coxsackie B viruses isolated, including three recovered directly from the cerebrospinal fluid, were shown to belong to Dalldorf's Type B4.
5. Serological investigation of seven patients excreting Coxsackie B4 virus alone showed a rise in titre to the homologous virus in six instances.
6. Serological investigation of two of the patients excreting Coxsackie B4 and Type 1 poliomyelitis showed evidence of infection with both viruses.

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Problems of Administering Service Contract Plans

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MY experience over the past seventeen years has been in the administration of a Blue Cross plan. I should like to present the purposes and objectives of the Blue Cross in order to place my remarks in a proper perspective.

In September, 1929, the Annual Convention of the American Hospital Association was held in New Orleans. The date is significant; it was at the height of the boom just one month before the stock market crash. A group of hospital trustees and superintendents from St. Paul, Minnesota, attended, fired with a great new idea they had been studying during the past several months. This idea was to make it easy for people to use the hospital in need by providing for prepayment of the care. It has been observed that when the time is right, an invention is made simultaneously and independently in different places suited to the needs of the time. So it was with this idea. This group from St. Paul found similar groups from various parts of the United States attending the Convention enthused with a similar idea. Dr. Kimball, Superintendent of Baylor University Hospital in Texas, was so far advanced in his studies that he proposed to make such a prepayment plan effective upon his return to Dallas and in fact, in December, 1929, a group of 1,500 school teachers in Dallas was enrolled and from this enrolment is traced the development of Blue Cross. The stock market crash and following depression was a set-back to the other groups but in spite of the conditions of the time, Sacramento commenced enrolment in 1932; New Jersey in January, 1933; and St. Paul in July, 1933. It is of interest to Canadians that it was in 1933 under the presidency of Dr. George Stephens, then Superintendent of the Winnipeg General Hospital, that the American Hospital Association undertook the guidance of the movement and adopted a resolution which eventually lead to the establishment of standards which hospitals offering a prepaid service and, by implication, Blue Cross must meet. These standards include, emphasis on public welfare, service benefits through hospital guarantee, recognition of public and professional interests and free choice of doctor and hospital. Established as a non-profit organization, economically sound, with co-operative and dignified promotion, the goal of the movement was to enroll the population under the best possible prepayment program at a reasonable cost and to develop sound usage of hospitals to meet public needs.

It should be recognized that the interest of the hospitals was in selling their

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service; in effect, the hospitals were establishing credit, borrowing from the business men the concept of credit or installment buying which made possible the great advances in large-scale production of so many items of expensive consumer goods. The hospitals were not interested in insurance as such. While there may be some element of protection or insurance to the consumer in what they were doing, their interest and concern was in the distribution of hospital care to the public—the sale of hospital service. It was necessary then to determine the essential need and to provide those who prepaid their hospital bills with the hospital care they were likely to use. From this concept and objective arose the administrative problems which are peculiar to Blue Cross. Having said this, it will be recognized that many of these problems are common in a degree to any form of health service plan. The administrative problems fall into two broad groups, namely, problems relating to the hospitals and problems relating to the public.

Problems Relating to Hospitals

If there is to be free choice of hospitals, if the subscriber patient is to receive service benefits and if these benefits are to be guaranteed to the patient by the hospitals, the hospitals must contract with the Blue Cross plan to supply the care. It is desirable that all hospitals in an area to be served by a Blue Cross plan cooperate with each other. Necessarily this involves some surrender of local autonomy. Hospital trustees and administrators may not be receptive to this broader concept and from year to year the personnel may change, requiring a re-education of the hospital authorities. In the early years of Blue Cross, the securing of cordial cooperation of all hospitals was an important administrative problem. Today, with a few exceptions all hospitals in areas served by Blue Cross are contracting hospitals, but relations of hospital and Blue Cross are of necessity a continuing function of a hospital relations officer. In Manitoba, the hospital contracts are now for one year periods and require annual re-negotiation.

Problems related to payment of hospitals for care

Where hospitals cooperate to provide a prepayment plan, fairness demands and some hospitals insist that one hospital not be paid more than another for equal service. A contractual arrangement with a hospital must be guided by fairness to the majority of hospitals agreeing to provide the service. The contract must protect a hospital's financial interest and its program of public service. Payments should encourage high standards, administrative efficiency and the welfare of the patient.

Two broad plans are in use for the payment of service benefits: charges set by hospitals and costs as incurred by them. The first is generally followed in Canada. It is somewhat surprising that this plan is acceptable to the hospitals and that charges to individual patients control the amounts paid by large scale contractors who guarantee definite payments for all their subscribers. Payments based on costs of services rendered appear to be more realistic and equitable and the trend in Blue Cross generally is to pay the lesser of charges or costs. The problem has demanded concentrated study resulting in the

development of "Principles of Payment for Hospital Care" approved by the Board of Trustees and House of Delegates of the American Hospital Association and published in 1954, outlining standards of adequacy and equity for contract payments for services furnished by hospitals to beneficiaries of third-part agencies such as Blue Cross or governmental departments.

Problems related to the total cost of hospital care

The hospitals in their sponsorship of voluntary prepayment of hospital care are aiming at distributing the cost of care, relieving the hospitals of financial deficits and alleviating the burden on the lower income groups. It was not anticipated that it might raise the total cost of medical care—too little consideration was given to human behaviour.

In Manitoba, hospital costs have increased 300% during the lifetime of the Manitoba Blue Cross. In spite of high costs, hospital admissions have increased from 1 in 10 to 1 in 7 of the enrolled population. If this were due solely to greater adequacy of care or easier access to essential care, the result must be considered good. But evidence is increasing that some, if not much of this increase in total cost is due to unnecessary and inappropriate use of hospital service.

In discussing this problem, it is difficult but necessary to keep it in a proper perspective. Prepayment has contributed so much in positive health, peace of mind and prolongation of life that an observed misuse of hospitals may be relatively inexpensive. Abuse in varying degrees does exist. The same benefits could be offered at less cost if abuse was prevented. For instance, a hospital bed represents a minimum of $10,000 in construction costs; it must be equipped, staffed and maintained. Nurses are in short supply and the difficulty of securing a minimum standard of nursing care is a grave concern to all administrators. If one-sixth of the expenditure for new hospitals, if one-sixth of the time of nurses is connected with persons not in need of care, the elimination of such misuse is an economic necessity.

What positive action can be taken? The problem is one of human behaviour. In designing benefits to be provided, it is necessary that all services essential to restoration of health be available but with such controls as will discourage unnecessary use of hospitals. Some form of co-insurance is indicated based on the thinking that people are not likely to spend their own money, however small an amount, to obtain care which they do not need.

The Manitoba Blue Cross regular contract provides 31 days at full benefits, additional 89 days at 50% benefits for each illness. The records show that 97% of patients are discharged in 31 days, 3% require an average of 14 days additional care and that 3 patients out of 1,000 require care over 90 days.

It has been found that under a contract providing 70 days at full benefits, 87% of patients are discharged in 31 days, i.e., 10% continue in hospital unnecessarily.

In the interests of the broadest possible benefits commensurate with lowest cost, experimentation in respect to days of care provided may be desirable. For instance, would the provision of 75% benefits after 21 days instead of 50%

benefits after 31 days materially increase the average length of stay and affect subscription costs?

Again the provision for a $15.00 deductible payable by the patient to the hospital discourages unnecessary hospitalization and materially reduces subscription rates. In rural Manitoba, the Community Service contract can be provided for a family for $10.00 less a year with a $15.00 deductible; $15.00 less a year with a $25.00 deductible than the fee required for a non-deductible contract.

Further, a cooperative payment of a percentage of the total bill serves to discourage unnecessary long stays and demands for services not required.

While only 3 patients out of 1,000 have been found to require care beyond 90 days, their care must be a subject of concern. Serious study and actual experience are proving that with a corridor deductible of reasonable amount and co-insurance, two years care or longer can be provided by a surprisingly low additional amount to subscription rates. In most commercial insurance, the corridor deductible has been $300.00 or $500.00 but this amount is applied against the total cost of care including hospital, medical, nursing and drug bills.

Finally, an extension of benefits rather than a limitation may have an important role. This is in the direction of home nursing care as an extension of hospital service. One experiment has shown that of 100 patients receiving home nursing, six home calls could be given at the cost of one day's hospital care and thereby, 132 patients could be treated an average of nine days each in the beds released. These are various controls on subscriber behaviour. Other action has been taken successfully in some, though too few, areas.

Problems Related to Claims Administration

Speed and accuracy are essential. Through streamlining procedures, it is possible to handle double the claims with the same number of personnel employed ten years ago. Of all claims 95% can be accepted within 24 hours of receipt and 2% can be promptly rejected. Uncertainty usually involves a medical question and a committee of doctors appointed by the Manitoba Medical Association meets monthly to review and advise on all such claims. Two standing committees, appointed by the Manitoba Medical Association and one appointed by the Manitoba Dental Association advise on: (1) Mental and Nervous diseases (2) Diagnostic admissions and (3) Dental admissions.

These committees consider actual claims of doubtful validity and also the efficacy of the treatment.

Problems in Relation to the Public

In developing Blue Cross, the hospitals undertook to devise a plan to enable the public to prepay the hospital care they were likely to require. The average citizen wants the highest standards of hospital care to be made available without regard to creed, color, or the economic situation, the costs of hospital care levelled so that his family will not be impoverished and the services made available to all at a reasonable cost to himself and to the community.

At the outset, Blue Cross issued one contract. Very soon it became apparent

that some people wanted a semi-private service, others preferred a ward service at a reduced rate. Of Manitoba's urban enrolment 72% desire semi-private service. With the extension of the plan to rural areas, a different pattern of need and usage was revealed. This should have been obvious, since the farm population requires care in occupational accidents, the fertility rate is higher, the average size of family is 4.4 compared to 2.8 for the urban population. These factors are offset in a degree by a two-thirds usage of the rural hospitals with their limited services and consequent lower average cost. It was necessary to develop a contract to meet the rural need. Later, co-incident with the recognition by the plan of this need for some form of cooperative payment by the patient to check misuse, which in one area actually reached 40%, the Union of Rural Municipalities and some farm leaders insisted on the introduction of such a feature. We now issue three Community Service Contracts: (1) a $15.00 deductible (2) a $25.00 deductible and (3) a non-deductible. 82% of those enrolled have chosen the first plan.

In this connection, it is of interest that in Minnesota, the Farm Bureau insisted on a $25.00 deductible in the contract issued its members. During the first year of its use, 19% of common employer groups in Minneapolis and St. Paul asked for this contract and now it is the most widely held in the Minnesota Plan.

You will appreciate that the need for flexibility of service, met by a multiplicity of contracts and agreements, has involved a major administrative problem, aggravated by the inevitable changes of those enrolled in marital status, residence, place of employment, etc., amounting to some 200,000 transactions a year. Accuracy of the records is a fundamental requirement.

Discussion

Administrative problems have been briefly reviewed under two broad classifications, problems in relation to hospitals and problems in relation to the public. Regardless of the character of a contract service plan, these two classes of problems exist. The closer the contract plan is to the producer, the smaller are the number of problems of the first class. But we have seen that Blue Cross has hospital problems even though its relationship to the hospitals is so intimate as to constitute almost identity. This arises because in a free society, all units cannot be expected to cooperate in the same degree. Since success is so dependent on complete cooperation, a constant effort must be made to obtain a cordial understanding of the plan's aims and purposes by each hospital. The official organization or association can be of the greatest assistance. The contribution made by the hospital association in each province, and the medical associations, through promoting good relationship merits warm appreciation.

The problem of adequate payment for care provided is a continuing one. After much study, experimentation and review, principles of payment for hospital care have finally been officially accepted but this must not be taken to suggest that they have been adopted by each hospital or plan. Medical care plans have met their obligations through fee-for-service but some uneasiness has developed amongst some doctors as to the propriety of this basis of payment. There are misgivings that fee-for-service may encourage quantity

at the expense of quality of care and multiplicity of care to the detriment of the surgeon or physician's long range interest. Where a variant of prepaid medical care plan has been developed, as in the Kaiser plan, it has been frowned upon by medical societies. There would appear to be a need for objective analysis of the effect of the method of payment upon the standard of service, but in the meantime, where a problem does exist in respect to payment for care, it ought to be accepted as basic that equity demands that those who provide the care receive a commensurate return.

Abuse does exist and involves loss beyond the cost to the service contract plan itself. Its impact varies from community to community with the standards of medical and hospital practice that prevail in the community and since it is basically a behaviour problem, the greater the percentage of the hospital or medical bill paid by the plan, the greater is likely to be the degree of misuse. It has been said 90% of the hospital bill can be prepaid at reasonable cost but the provision of 100% may increase the cost as much as 50%. Commercial insurance companies providing an indemnity of dollar-and-cents amounts calculated to pay 40% to 75% of the bill, do not experience the same degree of abuse as Blue Cross. However, since the amount of the account not covered may be a catastrophic amount, the problem is to determine what controls are required to give basic essential service at reasonable cost to the plan and subscriber.

Finally, in respect to relations with the public, the citizen must be free to exercise his initiative, to choose and to be assured of security against sickness bills. To meet his needs, the contract service plans must be flexible in the variety of coverage offered. In its administration, such flexibility may cause difficulties but with the proper streamlining of procedures, the contract service plan can function economically and efficiently.

COMING MEETINGS

Ontario Public Health Association
and
Canadian Institute of Sanitary Inspectors
(Ontario Branch)

King Edward Hotel, Toronto, Ontario
September 24, 25 and 26, 1956

The Family as the Unit in Public Health Programs

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MOST of us remember either from our own experiences or from our studies when public health agencies were created to conduct programs in special fields, such as school health, venereal disease, tuberculosis, etc. As a result there was often duplication of effort. I recall a situation where seven nurses representing as many different public health agencies, official and voluntary, visited in one home during the same six-month period. On one occasion four nurses made their regular visit on the same day. This multiplicity of agencies with the attendant increase in administrative costs and personnel proved too costly for the community. Voluntary and official agencies took cognizance of this duplication. There existed along with this duplication many gaps in service and as a result, amalgamations and re-organizations in health services were effected in the period of 1935 to 1945. World War II hastened the re-organization of many public health programs due to curtailed budgets and perhaps even more, to the shortage of qualified public health personnel, and by the mid-war years shortage of any professional personnel. Thus the change from a program of specialization to one of generalization in many public health agencies was effected and the pattern is now generally accepted. However, many special interest areas are still served through agencies devoted to one special interest.

Significant though the administrative and personnel factors undoubtedly were in bringing about this change in pattern for public health services, there were outside influences at work in the community which compelled the changes. Other agencies, notably mental health and social welfare, were concerning themselves in the community with projects for the betterment of mankind.

The focus of attention was no longer as in former years concentrated on the individual and his needs which gave rise to the pattern of specialization. Instead the emphasis was placed on the importance of the family. Everywhere we read of the family as the unit of service, the unit of illness and the unit of treatment. All needs are now considered from the perspective of the family. The scope of services offered today by a public health agency reflects this emphasis on the family. Now one nurse or at most two, enters any home where four to seven may have come formerly. Generally speaking the public health nurse today is duly authorized, indeed, obligated to enquire concerning, and to give consideration to the health needs of every member in that home.

Support for this newer concept of public health responsibility may be found in the basic philosophy of the World Health Organization as expressed in its Constitution. I wish to quote three of the principles set forth in this document which seem to reflect the most advanced meaning of "health".

1. "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or illness."
2. "The enjoyment of the highest standards of health is one of the fundamental rights of every human being without distinction of race, religion or political, social and economical condition."
3. "Governments are responsible for the health of their people, which can only be fulfilled through adequate social and health measures."

It is some satisfaction that the concept of family health which we have so recently embraced and towards which we are reshaping our programs coincides in most respects with the highly laudable principles of WHO.

This new emphasis in the public health program requires a new approach in the teaching of those who will be engaged in public health nursing. And who are these persons? Today the answer should be—all who enter the nursing profession. Therefore if we would have adequately prepared personnel we must give serious thought to the quality of the educational programs offered in our basic, in-service, and graduate courses. The nurse who remains in the hospital field has as great a need to know and understand the patient as a person, as a member of his family unit and of his community as has the nurse who works in the community agency.

In the recent nursing literature we find the phrase "Comprehensive Nursing" occurring frequently. The phrase is self-evident. Our professional Association, Canadian Nurses' Association and our American counterpart, the National League for Nursing, are each well launched upon their new structural paths. Conspicuous among the many improvements in each organization is the inclusion of all service matters under a single service committee or/and of all educational matters under a single education committee. Individual or special needs in either field will be met through sub-committees. This new machinery recognizes the importance of not splitting the patient into unrealistic parts and enables the teaching of the student to be more effectively directed toward the health needs of the patient as a whole person. The future nurse must be better prepared to "understand people" and more important "understand herself" in relation to other people if she is to maintain her place in the present day public health program.

As one authority stated recently a nurse who would be proficient in the maternal and child health field must be reasonably proficient in the many fields related to family health especially in obstetrics, pediatrics, school health, crippled children, orthopedics and rehabilitation.

Another field of public health nursing which has been considered to be highly specialized is that of industrial nursing now known as occupational health nursing. Relating to the family health concept, a most interesting statement appears in the last annual report of the Council on Occupational Health Nursing. I quote "emphasis in occupational health nursing is now swinging to the family.

. . . . the role of the health team in industry is changing from one which emphasized compensation cases to one in a more positive health program in which an effort is made to focus on human values."

In the recent Guide "Health Supervision of Young Children" published by the American Public Health Association the newer concepts of health supervision are vividly set forth. The implications for nursing are very clear and we would do well to heed its recommendations in the preparation of nurse personnel. As in other recent writings the stress is on family health. In discussing the role of the nurse the Guide says "She helps the family carry out what the physician recommends. She explains, elaborates, repeats, checks-up, follows through. She is concerned with the family as a whole in the community."

Similar illustrations of the "swing to family health" can be found by perusing the annual reports of agencies and professional committees not only in medicine and nursing but in the allied fields of nutrition, sanitation, health education and social welfare.

When reviewing some of the more recent professional texts and periodicals certain words and phrases seem to recur with increasing frequency. Two such phrases which have gained significance recently are "Health Team" and "Human values". The former denotes a new pattern for "doing", the latter a new pattern for "thinking". These new patterns for "doing" and "thinking" must be incorporated into the basic patterns of nursing education if the nurses of tomorrow are to be competent counsellors and family advisors. We need and want nurses with stability and tolerance and a sense of vocation, who are able to work with other people in the hospitals and in the community. I quote again "Nurses need technical skills, but they will make their greatest contribution always, as they have done in the past, through the art of nursing, and that means through the possession of skills in understanding human beings."

JOURNALS WANTED

To complete its files, the Circulation Department requires copies of the following issues of the Canadian Journal of Public Health:

MAY 1952

NOVEMBER 1945

Twenty-five cents will be paid for each copy. Address them to the Canadian Public Health Association, 150 College Street, Toronto 5.

The Self-Cleansing of Soft-Shell Clams: Bacteriological and Public Health Aspects*

I. E. ERDMAN, M.Sc. and A. D. TENNANT, Ph.D.

SHELLFISH purification problems have received considerable attention both in Europe and in North America, where sewage-polluted shellfish are recognized as a serious health and economic problem. Since the work of Dodgson (1) in 1928, it has been known that molluscan shellfish from polluted waters will cleanse themselves when relayed in clean sea water. Dodgson showed that purification of mussels could be assured by holding them in clean sea water for a period of 72 hours. A commercial purification process for mussels and oysters has been used in Conway, England, for many years, and has amply confirmed Dodgson's conclusions.

In 1947, Dallas and McCarthy (2) and Renn (3) studied soft-shell clam pollution problems in the State of Massachusetts. They found that clams readily cleanse themselves in clean sea water, but that, because of considerable difficulty in finding suitable cleansing areas adjacent to the centers of production of polluted clams, it was preferable to cleanse the shellfish in tanks of artificially-purified sea water similar to those used in Britain. In one experiment reported by Renn, the most probable number of coliform bacteria per 100 ml. of clam meats was reduced from 350,000 to 23 in 40 hours of treatment.

Fisheries and public health officials in Canada consider that there is a need for a cleansing system applicable to soft-shell clams (*Mya arenaria* L.) from the Canadian Atlantic coast. Large numbers of clam beds have been closed because of sewage pollution; because of extensive exploitation of clam stocks in the unrestricted areas, the quarantined stocks represent a considerable proportion of the total clam population. The shores of the Canadian Atlantic Maritime Provinces are indented with many accessible inlets, many of which are free from sewage pollution. A cleansing system which would make use of these natural waters would probably be more economical than one involving the use of large cleansing tanks and chlorinating and de-chlorinating equipment. The safe use of polluted clams after cleansing would be economically desirable, and would greatly reduce the public health hazard that arises from the small quantities of polluted clams that are marketed despite the best efforts of the Fisheries Department to prevent fishing in the closed areas.

In 1951, several experiments on the self-cleansing of soft-shell clams were conducted cooperatively by the Department of Fisheries and the Fisheries Research Board of Canada (4) in Charlotte County, New Brunswick. The investigation was continued in 1952 and 1953 (5, 6) by the same two agencies in cooperation with the Department of National Health and Welfare. Data

*Contribution from the Laboratory of Hygiene, Department of National Health and Welfare, Ottawa, Ontario.

obtained from these studies indicated that the commercial self-cleansing of soft-shell clams in natural sea water was feasible, provided that sea water in the cleansing area was of suitable bacteriological quality. The areas used during the 1951–1953 studies, while satisfactory during the greater part of the investigation, were subject to periodic land-wash pollution after heavy rains. The present studies conducted during May to September, 1954, in Bocabec Bay, Charlotte County, New Brunswick, were designed to evaluate the efficiency of the cleansing process, and to assess the suitability of the new cleansing area under varying weather conditions.

Methods

Source of Polluted Clams

Moderately-polluted soft-shell clams were dug by commercial diggers at Oak Bay, Charlotte County, and immediately transported by truck to the Bocabec Bay cleansing site, a distance of approximately 20 miles.

Construction and Operation of Cleansing Cars

Previous studies (5, 6) have shown that wooden floats ('cars') for holding groups of clam containers ('hods') were preferable to fixed shore installations. Nine floating cars of a type designed by the Fisheries Research Board of Canada (Fig. 1) were constructed of seasoned wood. Each car held 26 half-bushel wooden clam hods. The cars were sufficiently large and sturdy to be stable in small seas, to support a man's weight plus a full complement of clams, and to withstand the strain of 'grounding-out' when anchored in the intertidal zone. The hods were held at such a level that the clams in them were always submerged when the car was afloat; water percolated freely through the hods. The cars could easily be grounded at low tide for loading and discharging.

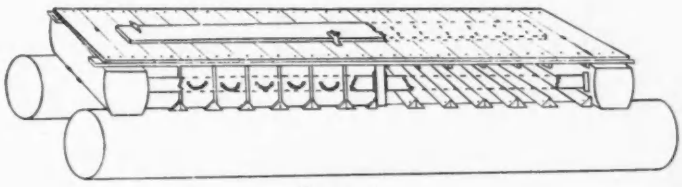

Figure 1

Clam Sampling

All lots of clams were sampled before cleansing began and again 24 hours before the clams were to be released from the cleansing process; the latter sampling was usually after 72 hours of cleansing, since most lots were released after 96 hours. Other samples were occasionally taken at various times during the cleansing cycle.

Triplicate clam samples were taken as follows: twelve hods of clams were selected at random from each lot; three clams of approximately equal size were taken from each of the 12 hods, each of the three going to comprise one of the triplicate samples thus obtained.

Water Sampling

Four permanent water sampling stations were selected near the cleansing cars (Fig. 2). Samples were taken from these stations at various tidal levels throughout the entire cleansing study. Water samples were also taken from the Holt's Point cleansing site used in previous studies (5, 6), and from small streams carrying run-off water from the watersheds of the two cleansing sites.

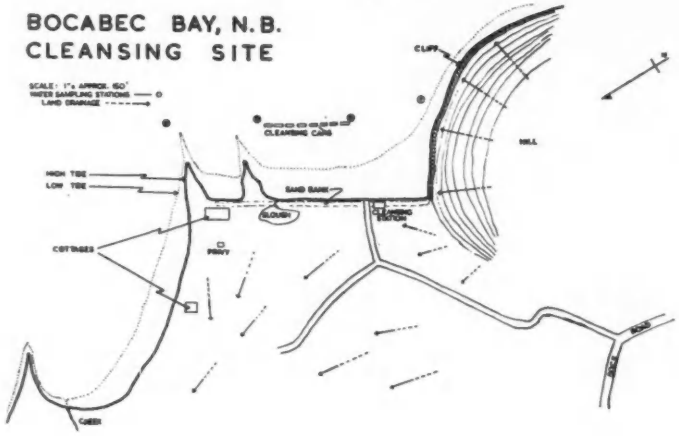

FIGURE 2

Bacteriological Tests

All clam and water samples were examined for coliform bacteria by the Standard Methods (7) MPN confirmed test using five tubes of lactose broth from each of at least three dilutions. Confirmation of all presumptive lactose broth cultures showing any amount of gas in 24 or 48 hours was made by transfer to brilliant green lactose bile (2%) broth. Results were expressed as coliform Most Probable Numbers (MPNs) per 100 ml. of sample.

Coliform bacteria were isolated from clam samples by direct plating on Bacto-Violet Red Bile Agar, and from water samples by the Environmental Health Center Membrane Filter (MF) method described by Clark *et al.* (8). After incubation for 24 hours at 37°C., representative coliform colonies appearing on the plates and membranes were picked for differential tests. These included: lactose fermentation at 37°C. and 44°C.; indole production and citrate utilization at 37°C.; methyl red and Voges-Proskauer reactions at 30°C.; and gelatin liquefaction in 7 days at 37°C.

Enterococci MPNs were determined for selected clam and water samples by the methods described by Winter and Sandholzer (9) and Litsky, Mallman and Fifield (10). The sample dilutions and the amounts of inocula used for the WS and LMF enterococci tests were the same as those used in the coliform MPN determinations.

Results and Discussion

Thirty-three lots of soft-shell clams were dug from Oak Bay and subjected to the cleansing process at Bocabec Bay. The mean coliform MPNs for replicate clam and water samples, and the percentage reduction of coliform MPNs during the cleansing process, are recorded in Table I.

TABLE I

Percentage Reduction of Coliform MPNs of Cleansed Clams, and Coliform MPNs of Sea Water During Cleansing

Lot No.	Mean Coliform MPNs per 100 ml. of Clam Meats			Mean Coliform MPNs per 100 ml. Sea Water During Cleansing		
	Initial (0 hrs.)	Final (72–120 hrs.)	% Reduction	Initial (0 hrs.)	Intermed. (24–48 hrs.)	Final (72–120 hrs.
1	4,366	1,533	64.8	14.5	3.4	2.8
*2	1,130	3,333	—	10.4	<1.8	6.4
3	2,533	843	66.7	<1.8	3.9	3.1
4	1,366	527	58.1	2.8	4.8	3.2
5	2,766	673	75.6	<1.8	2.9	2.3
6	2,333	560	76.0	2.1	4.4	<1.8
7	3,766	130	94.9	2.3	2.9	<1.8
8	2,733	893	67.3	<1.8	<1.8	3.2
9	1,567	256	84.9	<1.8	6.8	<1.8
*10	7,933	21,000	—	2.1	173.1	995.0
*11	2,467	56,000	—	4.3	173.1	995.0
12	17,800	1,667	90.6	452.5	118.6	42.3
13	7,300	437	94.1	132.0	66.3	22.2
14	1,767	330	81.4	42.3	18.5	3.8
15	840	56	93.3	14.8	7.3	7.5
16	660	73	88.9	10.7	12.8	<1.8
17	9,567	113	98.8	<1.8	2.3	<1.8
18	893	48	94.6	<1.8	<1.8	3.1
19	1,330	56	95.8	3.1	<1.8	3.2
20	1,934	85	95.6	<1.8	6.1	62.0
21	993	66	93.3	9.0	62.0	<1.8
22	5,667	73	98.7	<1.8	8.7	2.8
23	3,533	108	96.9	15.4	9.7	<1.8
24	4,133	350	91.5	2.8	4.2	8.8
25	2,767	317	88.5	8.8	9.9	23.9
26	1,667	353	75.4	<1.8	23.5	6.6
27	16,400	790	95.1	4.3	2.1	107.3
*28	1,667	1,673	—	<1.8	<1.8	113.0
29	707	86	87.8	<1.8	113.0	<1.8
30	1,767	112	93.6	<1.8	<1.8	<1.8
31	403	28	93.0	<1.8	2.0	<1.8
32	707	189	73.2	<1.8	<1.8	<1.8
33	807	277	65.6	<1.8	<1.8	<1.8
Ave.	3,554	380	85.3	—	—	—

*Not used in calculating averages.

All clam lots, with the exception of Lots 2, 10, 11, and 28, showed a marked decrease in numbers of coliform bacteria during the cleansing process; the mean coliform MPN for "fresh-dug" clams (omitting Lots 2, 10, 11, and 28) was 3,554, while the mean coliform MPN for the same lots at the end of the cleansing period was 380 per 100 ml. of sample. Thus the cleansing process

caused an average reduction of 85.3 per cent in the coliform bacterial content of clams cleansed under favourable weather conditions.

Run-off from the watershed following heavy rainfall adversely affected the cleansing process. The mean MPN for clams from Lot 10 after 96 hours cleansing was more than 5,000; after 120 hours cleansing, however, the mean coliform MPN had been reduced to less than 1,000, and the lot was released on the sixth day of cleansing (144 hours) on the basis of the presumptive 120-hour test reading. Specimens taken on release indicated that the mean coliform MPN of the clams had risen to 21,000 per 100 ml. Similar fluctuations were also observed in Clam Lot 11 and in the sea water from the cleansing area; this would suggest that clams quickly reflect an increase in the coliform content of the cleansing sea water during weather disturbances, and that a continued bacteriological check on the cleansing water and on a single clam lot would provide a satisfactory control for all clam lots undergoing cleansing treatment at the time.

The final coliform MPNs for Lot 28 were slightly higher than the initial MPNs for this lot. The failure to cleanse in this instance was probably due to the increase in the coliform bacterial content of the sea water noted after 72 hours cleansing (MPN 113). Lot 27 cleansed in a satisfactory manner, presumably because the coliform content of the sea water did not rise until almost the end of the cleansing period. No explanation is apparent for the failure of Lot 2 to cleanse.

Sea water samples were taken from the four fixed sampling stations in the cleansing area on 113 occasions during the study. The mean coliform MPN was less than 10 per 100 ml. in 85 instances, and exceeded 50 per 100 ml. in only 13 instances. Ten mean coliform MPN values of more than 50 per 100 ml. were obtained from consecutive samplings made after approximately 5 inches of rain had fallen (June 28 to July 5). It was this disturbance which caused the repollution of clam Lots 10 and 11.

The mean enterococci MPNs for all sea water samples tested were 3.4 (WS) and 7.7 (LMF) per 100 ml. Forty-eight of 60 samples of sea water from the Bocabec cleansing site were free from enterococci. This observation indicates that serious pollution was usually absent from the Bocabec site, and is in agreement with the results of coliform determinations. The mean enterococci MPNs for 21 specimens of run-off water were 97 (WS) and 234 (LMF) per 100 ml. The ratio between the LMF and WS enterococci results for all water samples tested was 2.4 to 1.

Twenty-four samples of cleansed clams gave mean enterococci MPNs of 74 (WS) and 86 (LMF) per 100 ml.; these values were considerably lower than the mean enterococci MPNs from 15 samples of fresh-dug clams (740 by the WS procedure, 691 by the LMF method).

The type incidence of 1,022 coliform bacteria isolated from sea water from the Bocabec cleansing site, Oak Bay, and Holt's Point, from run-off water at the Bocabec site, and from fresh-dug and cleansed clams, is reported in Table II. The coliform type ratios were similar in the water from the Oak Bay fishing area, in the cleansing water, and in the clams before and after cleansing. *Aerobacter* strains were the dominant coliform types.

TABLE II

TYPE DISTRIBUTION OF COLIFORM BACTERIA ISOLATED FROM WATER AND CLAM SAMPLES

Source	All "coli" Types	All "Intermediate" Types	All "*Aerobacter*" Types
Slough Drainage to Cleansing Area	4 (10.0)	13 (32.5)	23 (57.5)
Cliff Drainage to Cleansing Area	41 (39.8)	46 (44.7)	16 (15.5)
Sea Water, Cleansing Area	47 (28.1)	43 (28.8)	72 (43.1)
Sea Water, Holt's Point	35 (32.4)	50 (46.3)	23 (21.3)
Sea Water, Oak Bay	92 (24.3)	72 (19.1)	214 (56.6)
Fresh-Dug Clams	37 (32.5)	24 (21.0)	53 (46.5)
Cleansed Clams	34 (30.4)	22 (19.6)	56 (50.0)
TOTALS	290 (28.4)	275 (26.9)	457 (44.7)

CONCLUSIONS

Self-cleansing in natural sea water, under the conditions of the study, was an effective procedure for the cleansing of moderately-polluted soft-shell clams. There was an average reduction of approximately 85 per cent in the numbers of coliform bacteria in clams cleansed under favourable weather conditions. Repollution of clams under treatment occurred, however, when run-off following heavy rainfall caused a marked increase in the coliform content of the cleansing sea water. Several factors which are difficult to measure, i.e., the amount of rainfall and its distribution on the watershed, the quantity and bacteriological quality of run-off water draining to the cleansing site, and fluctuations in water temperature, make it difficult to accurately predict the extent of coliform pollution which will be present in the cleansing water at any given time. It may therefore be impossible, during unfavourable weather, to establish an arbitrary period of time during which clams should not be released from the cleansing process. Even under very unsatisfactory conditions, after 5 inches of rainfall, sea water at the cleansing site became satisfactory for clam cleansing purposes eight days after the disturbance. Less severe land-wash pollution will be quickly diluted and dispersed, but adequate bacteriological control tests on the cleansing sea water and representative clam lots will be necessary during any commercial clam-cleansing operation.

Since coliform type ratios were similar in the sea water from the fishing area, the cleansing sea water, and fresh-dug and cleansed clams, self-cleansing of soft-shell clams did not appear to be accompanied by any significant change in the type distribution of coliform bacteria.

ACKNOWLEDGEMENTS

Arrangements for the procurement, transfer, and handling of soft-shell clams cleansed during the present investigation were made by Mr. M. W. Mullan and Mr. D. R. Colwell of the Fish Inspection Laboratory, Department of Fisheries, Halifax, N.S. The cleansing cars used during the study were designed and constructed at the Atlantic Biological Station, Fisheries Research Board of Canada, St. Andrews, N.B.

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Mental Health—A Community Problem

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THERE can be no doubt that mental illness is the greatest single problem of the nation's health today and that the solution of this problem constitutes the major challenge to Public Health Agencies in the last half of this century. It is almost trite to quote statistics which show that approximately half of the hospital beds of the United States and Canada are devoted to the care of the mentally ill—or, to forecast statistically that between 8 to 10% of children living today will spend some part of their lives in a mental institution.

Many people reject such forecasts as being unrealistic or as propaganda; but, when one realizes that 10% of the men and women inducted into the Armed Forces during the second world war were rejected because of mental health problems, the percentage forecast becomes more pointed and probable.

The Honorable Paul Martin in his address to the International Congress of Mental Health last year, pointed out that the number of patients on the books of mental institutions in Canada had reached a record high of 65,827 which represented an increase of over 6,500 in the past five years. He also stated that the operating costs had risen from 35 to $60 million annually.

The financial burden of mental institutions and mental health agencies has now become the greatest single burden of the Nations' Governments. Some of this financial burden is due to building programs required to take care of previous requirements and overcrowding; as well as the increased rate of admissions. Ten thousand institution beds have been added; but, there is still need for further expansion.

Part of the increase in the admission rate to institutions can be explained by improved diagnostic facilities, and by public recognition of the need for and benefit of treatment in the early stages of mental illness. Treatment methods have improved so that recovery rates now range from 60 to 75% and the average length of hospitalization of persons discharged was nine months, 25% of whom were in hospital less than one month.

When one realizes that one in every 225 Canadians was listed as a patient in a mental hospital last year, the problem of mental health takes on more urgency. In comparison to organic disease, more time is lost because of mental illness than because of tuberculosis, cancer or poliomyelitis.

One family in 48 will contribute a patient to a mental hospital; whereas one family in 1,471 contributes a patient with poliomyelitis. In Alberta we can recall that two years ago, public anxiety and fear regarding poliomyelitis

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reached almost panic proportions. But, so far as mental illness is concerned, public interest is, as yet, sporadic and unorganized. To some extent, this is understandable because mental illness covers such a wide range of variation of human reaction. But, it is largely due to shame, fear, prejudice and ignorance which still exist in spite of the advances which have been made by public education. Public education regarding mental illness is one of the major problems in mental health just as it is with other public health undertakings whether it be fluoridation of drinking water, or the initiation of immunization programs. Dr. Jonathan Meakins has emphasized the need to direct public education to positive thinking and understanding of normal growth and development of the individual, physically, intellectually and emotionally rather than by lurid description of unsatisfactory conditions that may exist in some mental institutions. These exposures arouse public feeling and resentment, and occasionally accomplish something in the way of new buildings and facilities; but, they leave behind them in the public's mind, fear and dread of mental institutions which hinder the individual's family from accepting early treatment.

On the whole, radio programs and popular books which dramatically portray psychic abnormality tend to create morbid interest rather than constructive understanding of the mechanisms which lead the individual to his breakdown. In this way, they fail to serve public education. The community has a responsibility in this problem of mental health even if it is one of self-interest for ultimately the persons of the community bear the burden of cost through public taxation. But, the public requires leadership and sources of reliable information and instruction. We, as public health workers are the logical persons to whom they should turn.

Volunteer agencies such as the National and Provincial Mental Health Associations can do a great deal to bring together those who are interested in problems of mental health. They can help to mobilize public thinking in constructive channels. It is good to know that eight of Canada's ten provinces now have Mental Health Associations; but, we as public health workers must be prepared to actively support them with our skills and knowledge.

The community can further help in the organization of Volunteer Mental Hospital Auxiliary groups where they can work with patients under the supervision of the institutional staff. Where this has been done, there has been great benefit to the patients and the community at large.

The excellent progress in medical therapeutics and public health measures, in combatting and preventing disease and prolonging the span of life has accentuated the problems of the care of the senile and the mental defective. These groups constitute a large percentage of those who seek admission to mental institutions and remain as long term patients.

It does not seem reasonable that the aged, with some exceptions, should become mental hospital patients, when the majority could be cared for less expensively in or near the community where they have lived, where they would be close to their families and friends. It is a community responsibility to meet the needs of more municipal and district homes for the aged, where they can receive adequate medical attention and activity programs, suitable to their condition.

In regard to mental deficiency which exists in 1% of the population, it is again impractical to think only in terms of segregation and institutionalization. Most of these individuals do have abilities which could be put to constructive use for the benefit of the community at large. They require specialized training which can be given in opportunity classes in centralized rural schools as well as in city schools. We must go further than just training them in school. When they leave school, they must be integrated into employment in the community. This too, is a community responsibility and requires the education of employers, employees and labor unions to accept their responsibility. There is a great deal yet to be done in this area. But, it is a more constructive approach to the problem of dealing with mental deficiency. Another problem is to increase the number and effectiveness of the personnel working in the field of mental health, because much of the work must be done on the basis of personal relationship rather than mass procedures such as are used in immunization programs.

One American authority has stated that to provide an adequate supply of psychiatrists to meet the increasing needs, 20% of medical graduates would have to enter the specialty of psychiatry. It is doubtful if this happy state is likely to be achieved. So, we must orientate public health personnel in mental health as well as encouraging the training and use of persons in allied professional disciplines such as social work and clinical psychology. If we are going to solve the problems in mental health we must continue research in etiology–treatment–prevention–education of staff and public. In this way we will be able to use our personnel effectively.

It is encouraging to know that research in mental health is being carried out in 49 projects in Canada, financed by the Federal Health Grants, but, much more requires to be undertaken. The expenditures for research are less than 1% of the total operating cost of mental institutions.

Pesticides and Public Health

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AMONG the industrial developments of the post-war period, production of pesticides has assumed a special position, representing a branch of industry which has multiplied year by year. The vulnerability of man and domestic animals to many of these chemicals and the vast growth in their use have been the main reasons why public health authorities are giving special consideration to pesticides.

Prior to the war, the larger proportion of pesticides consisted of inorganic chemicals of relatively low human toxicity. The arsenates were the most common type. Highly toxic organic materials were used, both in the field and in sanitation practice but the range was limited to such examples as carbon disulphide, hydrogen cyanide and nicotine. Their dangerous properties were duly revealed in use experience, and deaths due to over-exposure from such examples are recorded in the literature. Nevertheless, the public health problem of the pesticides in pre-war years was not of comparable significance to the problem since the war.

The New Synthetic Organic Pesticides

The development of new pesticides was greatly influenced by the war. Shortages of materials for manufacture of many insecticides occurred owing to diversion of raw materials to war production. Supplies of botanicals such as pyrethrum and derris originating from Africa and the East were cut off. The accelerated demand for high agricultural production and armed forces requirements for pest control chemicals forced the development of substitutes. As a result of these conditions, new organic pesticides were synthesized, the first examples being DDT and benzene hexachloride. These compounds proved to be by far the most effective pest control agents hitherto developed and they came into widest use as soon as supplies were available for the domestic market after the War. The first result of this development was the decreasing use of the inorganic chemicals. A second result of even greater importance has been the effect of the new synthetic organics on the insect population. It was found that insects developed resistance to many of the new chemicals. Increased dosages had to be used, and new compounds were developed which are chemically-related but have structural differences sufficient to offset resistance. Finally, their effectiveness in destroying certain groups of insects brought

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about a disruption in the balance of the insect population and it was necessary to apply chemical control to new groups of insects not previously a problem as pests.

The striking increase in use of pesticides is shown by the sales during the period 1947–1954. Figures are not available for the period prior to 1947. Sales rose from $7,200,000 to $19,500,000 in the seven year period. During these years the overall price index dropped as a result of increased production. Hence the increase in the quantities sold has been in excess of the rise in dollar value of sales. Crop and seed treatment sales doubled in the period; weedicides increased almost five-fold; household and industrial sales tripled and sales of livestock treatments increased to six times the 1947 figure. In each instance the major factor in the sales increase has been the growing use of the synthetic organics. Under crop and seed treatments the sale of older inorganic chemicals such as the arsenates dropped from $942,004 in 1947 to $670,862 in 1954 whereas synthetic organics represented by DDT and others increased from $625,000 in 1947 to $2,225,000 in 1954. This shift from inorganic materials to synthetic organics has been even more marked when studied in terms of pounds of material sold. The synthetics 2-4 D and 2-4-5-T accounts for almost the entire sale of weedicides today. The use of DDT has been the preponderant factor in sales of household and industrial pesticides. The new organic materials also account for the increase in the sale of barn and livestock sprays excepting that in 1954 a large increase was registered as a result of the use of antibiotics for a variety of animal treatments.

Public health interest in the steadily increasing use of pesticides is related to the toxic nature of the synthetic organic chemicals which now preponderate. The main group, the chlorinated hydrocarbons was found to possess toxicity for laboratory and domestic animals, being neurotoxic in acute dosage and hepatoxic at the chronic level. In addition DDT has been found to be highly fat soluble and to be stored in substantial quantities in the fat depots of mammals. Other examples have been found to be converted to more toxic metabolites in the body. Factors of insect resistance and economic advantage have stimulated the development of further chlorinated hydrocarbons in recent years and a series with increasing toxicity both to insects and animals has come into use. It is noteworthy that the latest compound in this group, endrin, is almost as acutely toxic to mammals as the organophosphorus compound, parathion.

The organophosphorus materials represent the other main class of synthetic organics and entered the field a few years after DDT. Acting as anticholinesterase agents both to insect and animal, they were more powerful poisons than had previously been used in insect control with the possible exception of nicotine which had been limited in its range of effectiveness. These compounds filled a pressing need in the entomological field being effective against aphids and mites which had hitherto resisted chemical control. Subsequently, when flies and mosquitoes developed resistance against DDT and certain other chlorinated hydrocarbon chemicals, two new organophosphorus compounds diazinon and malathion were introduced, being effective against these insects. Diazinon and malathion have proved of lower toxicity to insects than parathion

and also lower in toxicity to animals but it is not considered that this is evidence for expecting early development of organophosphorus chemicals possessing high killing power for insects and low toxicity to man.

Effect of Pesticides on Health

Evidence concerning the extent to which human health has been affected by the increased use of pesticides is fragmentary. There exists on the one hand the picture presented from a recent pilot study of occupational disease by Trasko of the United States Public Health Service. Agricultural chemical cases for 1950 were reported as the second largest category of systemic poisoning cases in that year being exceeded only by lead poisoning. Furthermore the total number of insecticide cases originated from 3 out of 28 States reporting whereas the total for lead poisoning was derived from 23 States. A preponderant proportion of cases covered ill-effects from organophosphorus compounds, notably parathion. Trasko notes that the reports on pesticide cases doubtless reflect an incomplete notification of occurrence in view of the widespread use of these chemicals throughout the United States.

Further evidence of the occupational picture for the period has been provided by the Bureau of Adult Health of the State of California which has analyzed physicians' reports made under the State Workmen's Compensation Act in the past few years. In 1952, 177 cases of poisoning by agricultural chemicals were reported, being second highest among causes of occupational systemic poisoning as in Trasko's study. Of the 177 cases, 122 occurred among agricultural workers, 20 in manufacturing, 20 under the category of service and the balance were from miscellaneous sources. In 1953, comparable figures were not reported. In 1954, the Bureau handled 122 cases of systemic poisoning due to agricultural chemicals. Of these, 6 cases were due to exposure to chlorinated hydrocarbons and 101 cases to exposure to organophosphorus compounds. As in 1952, the majority of cases occurred among agricultural workers.

The health record of employees engaged in manufacture of pesticides has been well-maintained as far as is known, possibly because the primary producing organizations have had substantial experience over the years in protecting the health of plant personnel. The situation of the worker engaged in formulating mixtures and other trade preparations has been less satisfactory, for in the main, this stage has been handled by smaller concerns. Facilities for health protection have not been as elaborate as in the larger establishments of the primary producers. It is also to be taken into account in formulation that concentrated materials are being dispersed in volume into various media such as dusts, powders and emulsions, whereas in manufacture bulk quantities are handled. The potential hazard of exposure is therefore augmented at the formulation stage.

The incidence of ill-effects from the new pesticidal chemicals among the general population has not been systematically examined to date. However, in 1940, Neal and co-workers of the United States Public Health Service established from a three-year study that lead arsenate was not a significant hazard to health of the consumer of sprayed fruit or to the orchardist. Of

1,231 persons studied only seven, all orchardists, had a combination of clinical and laboratory findings directly referable to absorption of lead arsenate.

Current interest in the problem has been evidenced at international level by plans for a meeting of experts on the effects of pesticides on man to be held under the auspices of the World Health Organization in Geneva in June 1956. It may be anticipated that the problem will receive a comprehensive review on this occasion leading to clarification of the potential danger of this class of chemicals to man.

Effects of Chlorinated Hydrocarbon

The signs and symptoms of ill-effects due to acute exposure to chlorinated hydrocarbon pesticides tend to be non-specific and hence the role of these chemicals as aetiological agents in disease may not be recognized. In this connection it is of interest to note that Dr. Frank Princi speaking before the Agricultural Institute of Canada in 1952, drew attention to the need for specific tests to assist in diagnosis of chlorinated hydrocarbon poisoning. There has in fact been some controversy in recent years as to whether DDT and other chlorinated hydrocarbon pesticides do constitute a hazard to human health. The literature records a number of case histories in which ill-effects from these chemicals have been claimed, but in many instances a complete link with the chemical as aetiological agent has not been fully established. Thus, it cannot be stated at the present time that frequent cases of over-exposure to this group of chemicals are reported from among the general population. With regard to chronic poisoning from long term exposure the same position has to be taken. Residues of chlorinated hydrocarbon pesticides occur at low levels in sprayed areas and in food but the impact of this exposure on the health of the general population has thus far not been evaluated.

The effects of chlorinated hydrocarbon insecticides on laboratory animals have indicated a toxicity of higher order than that so far observed among exposed humans. For instance in 1950, Kunze and co-workers claim to have found evidence of liver injury in rats consuming a diet containing as little as 5 p.p.m. DDT for four to six months. More recently, in our Laboratory Service in Ottawa, evidence of increased growth of rats maintained on 20 p.p.m. aldrin in the diet has been revealed. Female rats showed disruption of the oestrus cycle. Reduced oxygen consumption and a rise in serum esterase were also found in these animals in the absence of pathology. The significance of such observations has yet to be delineated in terms of the health of the animal, yet the effects noted point to definite physiological changes at low exposure levels, changes which if long sustained may take on a health significance. Such findings strongly suggest that final delineation of the effect of the chlorinated hydrocarbon pesticides on the general health of the population may not be possible until more specific diagnostic tests are developed and until it is determined whether these chemicals exert sub-pathological effects which influence health.

The Effects of the Organophosphorus Compounds

In the case of the organophosphorus compounds, the specific anticholinesterase action and the characteristic signs and symptoms of acute poisoning,

have made it easier to establish the aetiological agent and render a firm diagnosis. Possibly for this reason, case reports of ill-effects from parathion, TEPP and related compounds have predominated among reports of ill-effects from pesticides, though it is to be realized that these chemicals, in the acute exposure, are more violent poisons than the common chlorinated hydrocarbons and therefore are more likely to be the cause of ill-effects. The substantial literature which exists on the effects of the organophosphorus compounds relates mainly to their use by agricultural workers, for compounds of this class have not been available to the general population until recently. With the introduction of the new and less toxic material melathion, for fly control, the anticholinesterase agents have entered the broader market and vigilance on the part of public health authorities will be required to assess whether this compound is being safely employed on the domestic scene.

Conditions of Use

The conditions under which pesticides are handled play as important a role as the basic toxicity of the chemicals, in determining whether the safety of the user can be ensured.

It was particularly evident from analysis of cases of ill-effects in the years immediately following the introduction of the organophosphorus compounds, that instruction of the user in safe handling methods had not been carried on to the extent which the basic toxicity of these chemicals warranted. Package instructions are provided as a condition of registration in North America, but in many instances where fatalities or illness occurred it was established that safe handling procedures had not been employed. In a substantial number of cases this has been the cause of ill-effects in household use of insecticides. Conditions of use also involve the equipment for applying the chemicals. Recent studies on equipment indicate that special safety features are needed when highly toxic materials are employed. Until equipment design has advanced generally to the stage where it eliminates the hazard in application, other measures for preventing ill-effects will be necessary with most pesticidal chemicals.

It is a feature of the present age that many potentially dangerous technical developments are coming into general use. Chemicals once handled only in industry are finding their way into other areas of activity including the home. This trend has been recently pointed up by the Committee on Toxicology of the American Medical Association which conducted a symposium on health hazards of chemicals late in 1955. Already some technical developments have had to be restricted in the interests of safety. This principle has in fact proved necessary in the pesticide field by restricting dangerous fumigants to use by licensed pest control operators. Restriction on a general basis is not suggested by experience with the new pesticides but there is ample evidence to indicate that the provision of printed instructions for safe use is not a full guarantee that a product will be used in a manner providing safety to the person applying the material or the general public which may be inadvertently exposed. In this latter connection, reference may be made to a recent field study by the Laboratory Service of the Occupational Health Division at

Ottawa. It was found that in dusting vegetables with parathion, drift of dust created hazardous air contamination for a distance of 300 feet. Excessive concentrations of material may occur on marketed produce through indiscriminate use. This represents another example of inadvertent exposure of the general public which cannot be insured against solely by printed instructions on a container.

The situation indicates that additional means for protection against the highly-toxic pesticides are necessary. New methods of instruction in safe use represent one approach. Elimination of the hazard in application, by incorporating safety features into equipment is another method of control. Restriction of use is a third procedure. For instance, in the agricultural field custom sprayers could be entrusted with application of very toxic pesticides in the same way that the pest control operator can be entrusted with the application of dangerous fumigants in the household and industrial field. Custom spray and dusting services are in fact being extended year by year for economic reasons. The most recent study of agricultural spraying and dusting practices in the United States was in 1952 and this showed that of the total acreage treated, 30% was done on a custom basis. The time may be approaching when the availability of custom service will make it possible to restrict the agricultural application of very toxic pesticides to trained and specially protected crews. These various methods of control would make it possible to realize on the economic value of new pesticides even though the new compounds might be highly toxic to the exposed operator.

Present Control on Pesticides

Control over the use of pesticides exists at the three levels of government in Canada. Products must be registered at the Federal level under the Pest Control Products Act. This legislation was primarily set up to ensure that pesticides would be effective for the purposes sold. There exists in this Act a section requiring that labels include instructions for safe use and the Minister of Agriculture under whose Department the Act is administered may deny registration to a product constituting a threat to public health. This in effect means products for which safe use instructions cannot be drawn. With respect to the public health section, the administrators of the Act have been provided with technical advisory service on request from the Department of National Health and Welfare.

Another legislative instrument at Federal level, the Food and Drugs Act, affects the public health aspects of pesticides. Section 4(a) of the Food and Drugs Act states that no person shall sell an article of food that has in or upon it any poisonous or harmful substance. Certain exceptions to this principle have been permitted under the Act in recent years and the presence of limited amounts of inorganic chemicals, arsenic, zinc, lead, copper and fluorine are tolerated as it has been proved by the manufacturer that residues at the stated levels are not a threat to health. These levels are specified under section B15002 of the Regulations under the Act. Action to establish tolerances for the synthetic organic pesticides has been under consideration in both Washington and Ottawa for several years. As with few exceptions, work-up of

new pesticides for market takes place in the United States, Canada has awaited action on tolerances in that country. The recently adopted Miller Bill established the regulatory procedure by which the Food and Drugs Act Administration will set up tolerances in the United States and a number have already been adopted. It may be expected that tolerances covering content of certain synthetic organic pesticides in food will be established in Canada in the near future.

The Department of National Health and Welfare Act also applies to the pesticide problem. Recognizing that the introduction of the synthetic organics has been rapid, the Occupational Health Division developed its Pesticide Bulletin several years ago, under authority of the Act, and with the object of assisting the provincial health departments by supplying information on new compounds coming into use in Canada. This approach has always been regarded as of the greatest importance because of the highly technical and rapidly advancing character of the pesticide industry. The preparation of this Bulletin has depended to a considerable extent upon maintaining a close working relationship between the agriculture and health groups in Ottawa, as a result of which earliest notice of forthcoming new products is secured and a continuing review of the field made possible.

The health aspects relating to the conditions under which the chemicals would be used were recognized as falling within the authority of the provincial departments of health and where appropriate the municipal officials. This pattern is exemplified by the regulations under the Ontario Public Health Act, embodying restrictions on the use of some pesticides. To date however no provincial department has passed regulations concerning the use of pesticides in situations other than those relating to households, industry or food establishments.

Public health protection in the agricultural use of pesticides has been approached from the educational aspect, without restrictive regulation, and through liaison between provincial departments of health and agriculture. The effectiveness of this less formal procedure depends upon a strong liaison being built up between the health and agriculture departments on a basis of mutual understanding of the respective goals of the two ministries. It has been emphasized that there are limitations in attempting to ensure safe use of pesticides merely by the provision of instructions on labels. More direct contact with the farmer and orchardist would materially aid in teaching the fundamentals of safe use of toxic chemicals. A most direct point of contact to this end is between agricultural representative and health unit officer, both of whom work in the locale of the agricultural user of the chemicals.

It may be expected that from time to time certain pesticides will assume a position of great economic importance in the agricultural field and yet have levels of toxicity which health experts consider too high to permit safe use except under specially controlled conditions. In instances of this kind, health officials face the problem of ensuring that special instruction in safe use is provided, that special equipment be used or that use be restricted to groups for whom it is practical to provide necessary health supervision. Under such circumstances, the public health group plays a key role in efforts to provide the farmer and orchardist with the economic benefits of such chemicals.

SUMMARY

The significance of the pesticide problem in public health is based upon the tremendous quantities of these potentially toxic materials now in use throughout the country. No other class of toxic chemical is so widely and freely used. Poisoning from agricultural chemicals has ranked second as causative agent in recent United States studies of systemic poisoning at the occupational level.

The role of trace amounts of synthetic organic pesticides which occur in present food supplies and the general atmosphere has not yet been delineated in relation to health.

Account must be taken of recent animal studies in which biochemical and physiological effects have been found at levels of intake below those producing classical pathological effects.

Health protection in use of pesticides must extend beyond labelling and the question of special instruction of the user, improved equipment and restriction of use is raised.

Letter from Great Britain

Social Surveys in Britain

(THE HOSPITAL POPULATION)

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MR. BRIAN ABEL-SMITH and Professor R. M. Titmuss in their evidence to the Guillebaud Committee* have made an analysis of the population in hospital as depicted at the 1951 Census. The results of this survey, which covered all persons in hospital on the night of April 8, 1951 (421,096), bring out the greater liability of the unmarried to enter hospital. In the hospital population, 231,100 were single, 136,208 were married and 53,788 were widowed or divorced. Single males over 15 years (21% of the male population) made up 47% of the total male population in hospital. Single females (19% of the female population) had 40% of the total female population in hospital. Single persons appear to have a greater liability either because of more frequent admission or because of longer stay.

*The Cost of the National Health Service in England and Wales. Cambridge University Press, 1956.

There is, of course, for everyone an increasing risk of occupying a hospital bed as age advances, but the proportion of single persons in both sexes rises more sharply than does that for the married; the widowed and divorced lie somewhere between. Thus for single males the proportions (per cent) in hospital of the population at risk in different age groups were 1.4 (15–44), 5.9 (45–64), 6.6 (65–74) and 8.5 (75+); whereas for the married the percentages were 0.3, 0.6, 1.0, 1.5. Among the married people, even at ages over 75, the proportion of the population at risk in hospital was only about 2%.

When the patients in mental and mental deficiency hospitals are subtracted the rates are lower, but the same general trends are present, except that the divergence of married and single begins after 45. Thus in hospitals other than mental or mental deficiency, married men and women over the age of 75 amount to only 1.1% of the population at risk, whereas, for single men the figure is 5.2 and for single women 3.3. If we now remove the chronic sick and other special hospitals, the remaining general hospitals (particularly teaching) do not follow the general pattern so clearly. But the differences in the proportions of married and single persons in hospital, though less marked, are still present. Finally, in the chronic sick hospitals the distinction after 45 years between married and single is most extreme:– for single men 0.33, 1.14, 2.90 as compared with 0.02, 0.08, 0.29 for married men. The population (over 15 years) in chronic sick hospitals consists of 38% single and 42% widowed or divorced. About two-thirds of all hospital accommodation for the aged over 65 is used by the single, the widowed or the divorced.

In the mental hospitals (excluding mental deficiency) the bulk of the patients are single persons (82,594 single, 41,889 married and 16,569 widowed or divorced). The percentages in mental hospitals of the single male population in different age groups were 0.5, (15–44), 3.7 (45–64), 3.8 (65–74) and 3.1 (75+) as compared with those of married men, 0.1, 0.2, 0.4 and 0.4. At a slightly lower level the same is true for women. The admission rates to mental hospitals* show the same picture.

These observations made by Abel-Smith and Titmuss about the hospital population recall the well-established fact that single persons have higher death rates than the married. The married state appears to be a powerful safeguard against admission to hospitals in general and to mental and chronic hospitals in particular. The precise reasons can obviously not be stated with any certainty. It might be that those who do not marry at all, or until much later, present other abnormal characteristics which might predispose them to hospital illnesses. Many will not marry because of the condition which has already, or will later, take them to hospital. But the difference between the married and the single probably contain many more significant factors, not yet fully assessed, which could result in a hospital episode. The risks of the single existence may be greater in many different ways. The physiology of healthful living may more often be neglected. The population of the mental hospitals suggest that powerful forces for good in the field of mental hygiene

*The Registrar General's Statistical Review of England and Wales for the year 1950–51, Supplement on General Morbidity, Cancer and Mental Health. H.M.S.O., 1955.

are at work within the married state. Perhaps it is that marriage gives purpose to life and that this in turn contributes to wholeness. At least it is evident that the widely held belief that our wives drive us mad has no statistical support whatsoever. Mental hospitals in Britain† are maintained to support those who have battled alone with life's vicissitudes. This should be a salutary lesson to the 2,899,600 single males and none-the-less for the 3,130,400 single females (1951 Census over 20 years). In fact marriages have become more frequent and earlier in Britain, as in the rest of the western world, during the past 20 years. There may be endocrine factors at work. Single women die from cancer in the breast more often than in the uterus; married women from cancer of the uterus more often than in the breast. Married women without children suffer in the same way as married women with children.

But the greatest single consideration must be social. Illness within the married state is better supported. In its early stages it may often be better cared for; in severe episodes there are more resources within the home than in 'digs'. The exact rôle played by the family in this remarkable picture cannot be assessed without much further information. The part played by surviving children is likely to be considerable. The divergence—excepting for the mental hospitals—takes place after 45 years, when the support of children is most necessary. For the old it is often everything. There is also the greater prevalence of chronic conditions after 45 years.

At a time when the rôle of the hospital in the total process of preventing and treating ill-health is under close scrutiny, this is obviously a facet which could well be more widely studied. Hospital care is becoming too costly to be used only, or mainly, on social grounds—if adequate alternatives can be found. Public health departments everywhere might study the needs of the single adult with a view to meeting their needs within the community. Should the need to marry be made the subject of health education?

†The evidence for Scotland is much the same. Personal communication, Dr. Donald Cameron.

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PROPOSALS FOR A NATIONAL INSURANCE PLAN FOR HOSPITAL, DIAGNOSTIC AND RADIOLOGICAL SERVICES

ALTHOUGH there had been informal discussions on national health insurance plans prior to the outbreak of world war II it was not until 1943 that Parliament appointed a committee on social security and in 1944 legislation was passed providing family allowances. In that year Dr. J. J. Haegerty on behalf of the Department of National Health presented a report on national health insurance and plans for the advancement of health in Canada through a system of grants-in-aid to provincial health departments. After the close of world war II a Dominion-Provincial conference on reconstruction was convened in Ottawa and a series of proposals were presented including a national health program and a comprehensive health insurance plan, the latter to be worked out in progressive stages on an agreed basis. These proposals were based on the adoption of certain tax agreements by the provinces with the Federal Government. As these proposals were not found acceptable, the Government continued studies and in 1948 introduced a national health program providing grants-in-aid to the provinces, amounting initially to $30,000,000 a year. These grants were ten in number and included assistance in hospital construction. In announcing this policy, the Prime Minister stated that the health grant program, particularly the grant for hospital construction, was a step towards national health insurance in providing increased hospital accommodation. In 1953 the health grant program was extended by introducing three additional grants; namely, Child and Maternal Health, Medical Rehabilitation and Laboratory, Diagnostic and Radiological Services. Increased diagnostic and radiological services would be greatly needed in the operation of any plan of national health insurance.

Last fall, a Dominion-Provincial conference was called to consider new proposals by the Federal Government relating to fiscal matters. In the discussions, references were made to national health insurance both by the Federal Government and by several of the provincial governments. As the conference was primarily for discussion of financial policies, a special conference was called on January 24 last in Ottawa, to give consideration for a national insurance plan relating to hospital services and the provision of diagnostic and radiological services as a step toward national health insurance. These services would require entirely new funds on the part of the Federal

Government in contrast with the provincial governments where a large part of the expenditures are already being provided. At this meeting the Honourable Mr. Martin, Minister of National Health and Welfare, outlined the services provided by his department and their relation to health insurance. Attention was drawn by him to the health insurance provisions which have long been in effect giving services to approximately 125,000 mariners. It is of interest that about 60% of the Federal Government's expenditures for health relate to medical and hospital care of approximately 500,000 Canadians for whom the Government has assumed direct responsibility; namely, members of the Armed Services, Indians, Eskimos, mariners and newly-arrived immigrants. He stated that the Federal Government was prepared to bear approximately half the cost of hospital, diagnostic and radiological services. The offer on the part of the Federal Government is to share with the provinces in the cost of standard ward care without any limitation on the period of stay in general, chronic or convalescent hospitals, plus diagnostic, laboratory and radiological services for in-patients and out-patients. The costs which the Federal Government has offered to share do not include hospital administration costs, capital costs, depreciation, the provincial costs of administering the health insurance plan nor the cost of mental illness and tuberculosis as it is considered by the Federal Government that mental hospitals and tuberculosis sanatoria are being aided through the national health grants.

The amount to be paid to each province participating would be determined by a formula in which the federal share would amount to 25% of the per capita cost of health insurance in every province plus 25% of the average per capita cost for hospital and diagnostic service across Canada. In British Columbia, a high cost province as far as hospital charges are concerned, the Federal Government would pay approximately 45% of the total. In Newfoundland, where per capita costs are lower, the federal share would amount to as much as 75%, whereas in Ontario the assistance would amount to less than half the cost. The estimated cost to the Federal Government would be between $350,000,000 and $400,000,000.

At present, government-sponsored hospital care programs are operating in four provinces, namely British Columbia, Alberta, Saskatchewan and Newfoundland. British Columbia is the first province to indicate its participation in the federal proposals. In Ontario, a hospitals commission has been appointed for the purposes of developing a balanced system of hospitals, to approve of the establishment of new or additional facilities and to administer any insurance scheme. In Newfoundland, the provincial government has announced its intention to provide a health insurance plan for all its 175,000 children under 16 years of age, to include medical, dental and ophthalmic benefits. Commencement of the scheme is expected to be made this year but the government states that it will require three to five years before the plan is fully implemented. The second province to accept the proposals is Saskatchewan. It would appear that at least five provinces will express their willingness to join in the development of the program. Prime Minister St. Laurent stated that the Federal Government is prepared to introduce legislation during this session of Parliament to launch this program if more than half the

provinces representing the majority of the Canadian people agree to participate. The implementing of the plan therefore, will require acceptance by either Ontario or Quebec.

In presenting the proposals to the public, every effort should be made to avoid misunderstandings. The plan relates to hospital care, diagnostic and radiological services and not to the provision of medical care as ordinarily understood. It is a major step toward national health insurance. Important contributions have already been made through the national health grants program and Canada now has approximately 90,700 hospital beds, providing 5.7 beds per 1,000 population. This number includes active treatment, chronic, convalescent and sanatoria beds.

The offer of the Federal Government to share approximately half the cost of providing these services, including laboratory, diagnostic and radiological services if half the provinces representing half the population of Canada are in agreement, makes possible specific action by the provinces. Consideration by the provinces will require time. Important progress has been made and full consideration must now be given by provincial departments to all that is involved.

THE ASSOCIATION ESTABLISHES MEDICAL CARE SECTION

MEMBERS of the Association know of the holding of a Canadian Medical Care Conference in conjunction with the annual meetings of the Association in Quebec City and Edmonton and the convening of a Third Canadian Medical Care Conference on the occasion of the forthcoming annual meeting of the Association to be held in Saint John on May 29.

At the Edmonton conference, consideration was given to the holding of a third conference and it was felt that the organization of a new section in the Association devoted to medical care would be helpful. Some months ago, the Executive Committee received a petition from a group of members of the Association requesting formally, the organization of a section on medical care. The Executive Committee has approved of the request and the announcements relating to the forty-fourth annual meeting to be held in Saint John provide for the first sessions of this new section. The meetings of the section will be held in conjunction with the Third Canadian Medical Care Conference. In establishing the section, there is but one objective; namely, to direct thoughtful consideration to the ways in which medical and health services in Canada may cooperate together in the study and development of plans adequate for our Canadian needs. Public health is concerned with the whole field of health. To the extent to which government is concerned in all services that affect the health of the population, public health officers will be called on to give advice and cooperate in the provision of services through directing expenditure of public funds.

Without question, the new section has much to contribute and the forthcoming meetings of the Third Medical Care Conference and the section will provide the opportunity for helpful discussion.

TEAM WORK IN PUBLIC HEALTH

PHYLLIS J. LYTTLE, Reg.N.
Director, Nursing Service, Department of Public Health, Halifax, Nova Scotia

MANY of you will remember that at the thirty-seventh annual meeting of the Provincial Association of Medical Health Officers of Nova Scotia, in 1951, it was decided that there should be an Atlantic Branch of the Canadian Public Health Association.

To-day we have 200 members and there are representatives from at least twelve groups whose interest is Public Health and Preventive Medicine. Some of these representatives are: Divisional Medical Health Officers, Medical Officers of Health, General Medical Practitioners, Medical Specialists in a variety of fields, Sanitary Inspectors, Co-ordinators of health programs, Nutritionists, Victorian Order of Nurses, Halifax City Public Health Nurses, Members of three armed services, Reverend Sisters, Public Health Nurses, Officials of Indian Health Services and Rehabilitation Workers.

At the annual meeting of the Canadian Public Health Association in Ontario in October 1952, Dr. R. D. Defries, the President, emphasized in his presidential address, the need for "Partnership in Public Health". I think you will agree with me that with all these groups represented here, we have become partners in the Atlantic Branch for our own benefit and for the benefit of those whom we serve. I feel that the improvements made in various fields of health are due to the efforts of many people working together. Progress in solving health problems will only be made by the combination of all our efforts under competent leadership.

I would like to speak about several fields of public health efforts in which the co-operation of many partners has resulted in definite improvements in the health of the people.

Communicable Disease Control

The death rate from tuberculosis in Nova Scotia in 1950 was 27.7 per 100,000. In 1954 the rate was 11.3. This gratifying reduction is due in part to the advances in the treatment of tuberculosis by means of surgery and the use of new drugs including streptomycin, isoniazid and para-amino salicylic acid. As a result patients are returning to their homes and to their work in much shorter time. However, the case finding program has not changed greatly and the need for its continuance remains the same.

In the control of diphtheria, whooping cough, tetanus and smallpox the immunization program is an excellent example of partnership, with many participants including voluntary helpers. This fact was realized more than ever last spring, when many persons co-operated in the Salk vaccination program.

Maternal and Child Health

This program has been expanding over the past four years. In 1950, 7% of all home visits by provincial public health nurses were made to infants. This has risen to 30% in 1954. The Department of Public Health in 1950 organized two Child Health Conferences, in 1954 there were 45.

The latest development is the organization of Prenatal Classes. These have been held at the Dalhousie Public Health Clinic and have proved to

Presidential address given at the fifth annual meeting of the Atlantic Branch of the Canadian Public Health Association, held in the Cornwallis Inn, Kentville, Nova Scotia, November 9 and 10, 1954.

be very helpful. A Guide for Prenatal Teaching has been prepared by the Division of Maternal and Child Health and the Nutrition Division. Classes will also be started in the near future in Springhill and Liverpool.

Mental Health

The facilities in Halifax and Dartmouth for caring for the mentally ill have been improved greatly both in regard to active treatment and prevention.

In Digby, the Psychiatric Clinic, in operation for several years, has proved to be very beneficial to Digby County residents. Recently another clinic has been opened in Wolfville for the Fundy Division.

Occupational Health

Last year the Registered Nurses' Association of Nova Scotia asked the Industrial Nursing Group to name a chairman for an Industrial Nursing committee. This committee has been recently renamed "The Occupational Health Committee", at the request of the Occupational Health Division, Department of National Health and Welfare, Ottawa. At the present time, there are 13 nurses engaged in Occupational Health work in Halifax and its vicinity and 10 others are working outside this area. Dr. J. G. B. Lynch, employed by the Dominion Steel Company and Canadian National Railways in Sydney, is engaged in occupational health work and there are a number of physicians doing part-time industrial health work.

Geriatrics

I think you will agree with the statement recently published by the Health League of Canada: "It is agreed that geriatrics, the science of the diseases of the aged, is the least developed field of medicine, and that, with the increasing percentage of aged persons in the population, it is the most challenging of all needs in the science of medicine".

In the solution of the problem of caring for the aged, we shall all be required to work extremely hard to obtain results.

I would like to thank all the personnel of the interested organizations and associations, including the voluntary helpers, who have so willingly given their time and effort to bring about the changing patterns which I have mentioned. We all realize that there are many other aspects of Public Health work not included in this short summary and that these are just as important as those mentioned.

As a branch of the Canadian Public Health Association, I feel that we should pay tribute to Dr. Robert Davies Defries in his recent award. Dr. Defries has been one of the many hard workers in our parent association. His work in connection with the Salk Vaccine Production Program at the Connaught Laboratories, has been recognized with the award of the Lasker Foundation of New York City. It would appear that this award has come at a most appropriate time, as Dr. Defries has recently retired from his position as Director of the Connaught Laboratories.

In conclusion, I would like to quote two definitions of health, which I feel illustrate the change of attitude to health, through the last two hundred years. In Samuel Johnson's Dictionary, published in 1755, health is defined as "freedom from bodily pain or weakness". In the charter of the World Health Organization, health is described as "a state of complete physical, mental and social well being and not merely the absence of disease or infirmity".

To attain this new ideal of health we must remember that no one person or group of persons can accomplish it alone. There is needed the help, not only of many professional workers, but also the help and interest of every person in the community.

THE VIRUS LABORATORIES OF THE LABORATORY OF HYGIENE

Department of National Health and Welfare
Ottawa, Ontario

THE new Virus Laboratories, an integral part of the Laboratory of Hygiene, were formally opened by the Minister, the Honourable Paul Martin, on December 16, 1954. The building is situated in Tunney's Park area in the west end of Ottawa and is a few hundred yards from the Ottawa River.

It is of reinforced construction and is the first of several units the Department has planned to erect in this new centre of Government buildings. There are two main floors, a basement and penthouse. The latter houses the air conditioning and air filtration systems. The basement provides space for a service workshop, transformer rooms, cage rooms, incinerator and storage space. The two main floors are divided into an isolation unit and an open area. In the open area of the first floor are located the serodiagnostic and histopathology laboratories, the electron microscope room and accommodation for normal animals. The corresponding area on the second floor is occupied by the administration offices, library, rooms for normal monkeys and a laboratory which is presently being used for the safety testing of poliomyelitis vaccine employing tissue cultures. Monkeys which have been inoculated with vaccine are kept under observation in rooms for normal monkeys.

In planning this building the primary objective was to provide laboratories in which highly infective agents could be handled with the least possible risk to scientific and technical personnel. It therefore became necessary to provide certain structural arrangements not ordinarily considered essential in laboratories. The closed, or isolation areas have a lower air pressure than the open areas and are separated from the latter by air locks. This arrangement insures direction of the air flow toward the isolation areas, rather than toward the open areas, when one passes through the air lock. The outer entrance to the air lock is kept locked at all times.

It was essential to reduce to a minimum the chance of workers carrying away infective material on their cloth-

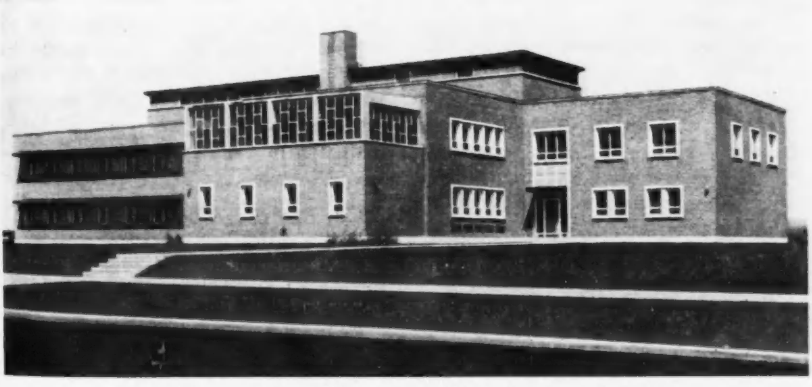

FIG. 1. The new Virus Laboratories of the Laboratory of Hygiene.

ing. Therefore, personnel entering isolation areas do so through dressing rooms where their outdoor clothing is exchanged for sterilizable garments. When workers leave the isolation unit it is assumed that their laboratory clothing is contaminated and requires to be sterilized. Following the removal of clothing, workers receive a shower and dress in their street clothing. Laboratory clothing and towels are autoclaved before being sent to the laundry.

Protection from air contamination in the isolation areas is afforded by a combined system of air filtration and air conditioning. The air to be used is channelled under negative pressure through filters and an electrically charged precipitron unit to remove dust particles and to reduce to a minimum microbiological contaminants. After being brought to the required temperature the air enters the laboratories through ceiling outlets. The negative pressure draws the air through ducts situated beneath the windows and above the work benches. Thus, any infective aerosols created at work are immediately removed and the withdrawn air is incinerated prior to discharge outside the building.

An additional safety measure is provided within the isolation units. It comprises hoods, constructed on the work benches, in which the air is under negative pressure. Superimposed over the hoods are incinerators which sterilize the updrawn air. All infective material is handled under these hoods.

The Isolation units on both floors have accommodation for inoculated animals, as well as autopsy rooms for infected animals. On the first floor a number of the animal rooms have facilities for enclosing the cages in air-tight compartments in which the air is introduced under negative pressure and from which the discharged air is led to incinerators. Air in the animal quarters is not recirculated. The animal quarters in the second floor isolation unit include a mouse room and five separate monkey rooms. On both floors the cage-washing room on the isolation side communicates with that on the open area side by way of a very large autoclave which can accommodate sixteen monkey cages at one time. Cages can thus be put into the autoclave on either side and removed on the same side, or can be sterilized on the isolation side and removed into the open area. Each cage-washing room in the isolation area has an incinerator in which dead animals and infective material may be disposed of as required.

Commencing directly after occupancy of the new laboratories the safety control tests of all Salk poliomyelitis vaccine required a large proportion of the time of the staff. The government control procedures for this vaccine, prepared for the large scale trial by the various Provincial Departments of Health in 1955, involved tests in many monkeys, other animals and large numbers of tissue culture tests.

Research is being conducted on the stabilization and purification of virus diagnostic antigens with a view to increasing their specificity. Other investigative work currently in progress involves the practical application of tissue culture techniques to virological studies. The Virus Laboratories will continue, as in the past, to render assistance to the Provincial Department of Health Laboratories on request.

NEWS

Saskatchewan

A THREE DAY FIELD STAFF CONFERENCE of the Saskatchewan Department of Public Health was held concurrently with the annual meeting of the Saskatchewan Division of the C.P.H.A.

REGINA RURAL HEALTH REGION has recently planned and conducted eight institutes in hygienic foodhandling in four of the larger centres in this region. A special feature of the institutes was a play, followed by a general discussion, which emphasized the importance of the waitress's part in clean foodhandling. In addition to the play, each program included six films and film strips and three demonstrations. The sessions were well attended in all centres.

Manitoba

THE MANITOBA LEGISLATURE HAS recently passed an Act which calls for the establishing of a foundation on alcoholism. "The Alcoholic Foundation of Manitoba" has been established in accordance with recommendations made by the Bracken Liquor Commission. Its purpose is to arrange for facilities for treatment and rehabilitation of alcoholics and set up an educational and research program on alcoholism.

MANITOBA'S IMMUNIZATION CAMPAIGN against poliomyelitis got underway in early April with the arrival of the first shipments of Salk Vaccine from the Connaught Medical Research Laboratories. Before school closing the Department of Health and Public Welfare hopes to see over 150,000 children receive their first and second vaccinations and a third "booster shot" given to those who received two doses last spring.

Ontario

AMONG IMPORTANT PIECES OF LEGISLATION, the Lieutenant-Governor singled out the establishment of the Ontario Water Resources Commission, and that of the Hospital Services Commission. Of the first one, he said: "This Commission, which will follow the pattern established by The Hydro-Electric Power Commission of Ontario, has been given authority to develop water supplies and to build and operate water supply and sewage disposal systems. Funds have been provided to enable it to set up its administrative organization and to make a start in southern Ontario where water shortages and sewage problems are most pressing and where there are distinct advantages of development on a regional basis.

"THE HOSPITAL SERVICES COMMISSION," said the Lieutenant-Governor of the other piece of legislation, "has been established to achieve an optimum integration of hospital services in Ontario and to provide the foundation for a hospital insurance program. Intensive studies have been made of this whole complex and difficult subject. The Legislative Health Committee held sittings at which full details of benefits, costs and implications of alternative plans were reviewed. As very heavy costs are involved in the operation of a hospital insurance system, it is imperative that all avenues be thoroughly explored and that there be the widest possible dissemination of information."

Nova Scotia

DURING THE MONTH OF MARCH, twenty-six provincial public health nurses were privileged to attend the Institute sponsored by Dalhousie School of Nursing on rehabilitation. Miss Phillips from New York Visiting Nurses' Association was guest speaker.

MRS. AMELIA SHAWCROSS has joined the staff as public health nurse in the Stewiacke area. Mrs. Shawcross was formerly Miss Amelia MacNeil and had been employed by the Halifax City Department of Health.

MISS FLORENCE THIBAULT joined the staff as public health nurse receiving her in-service training at Yarmouth before taking the course in public health nursing at Dalhousie University.

MISS GERTRUDE ANDERSON who had been one of the provincial public health nurses for over twenty years died at her home in Annapolis Royal early in March. Miss Anderson was one of the nurses who joined the Department of Public Health soon after the Health Department was established in Nova Scotia.

New Brunswick

THE 1956 POLIOMYELITIS VACCINATION PROGRAM in New Brunswick was spearheaded by a meeting called by Dr. J. A. Melanson, Chief Medical Officer, of Health Officers, Dr. H. L. Logan, Dr. F. C. Hazen, Dr. R. D. Landry, Dr. V. Gendron, Dr. J. R. Allanach, Dr. P. Laporte, as well as Dr. G. E. Maddison, Assistant Chief Medical

Officer and Director of Tuberculosis Control, Dr. A. P. Chaisson, Director of Communicable Disease, Dr. C. W. Kelly, Director of Health Planning Services, and Miss M. Hunter, Director of Public Health Nursing. The meeting was held on March 16, and chaired by Dr. Melanson to determine those who would receive the vaccine for 1956 and also the method by which it would be administered.

DR. J. R. MAYERS, Director of Maternal and Child Health visited the Boston Lying-In-Hospital from April 2–9 to observe obstetrical procedures. The Lying-In-Hospital serves as the Harvard School of Obstetrics.

MR. EMERSON WILBY, Assistant Registrar General of Vital Statistics was the New Brunswick representative at a meeting of the American Association of Registration Executives which took place in Boston from March 12–16.

MR. JOHN KEAYS was in Ottawa for a week, visiting the Information Division of the Department of National Health and Welfare.

MISS EDITH WARMAN, Miss Violet Facey Crawther, Miss Vera Hamition, Miss Phyllis Batt and Miss Ray McKenzie attended a three day institute on "Nursing Aspects in Rehabilitation and Care of the Chronically Ill" at Dalhousie University on March 21, 22 and 23. Miss Batt participated in a symposium on "What is being accomplished today in Rehabilitation Programs." The paper presented by Miss Batt was prepared jointly by Miss Batt and Miss McKenzie.

A PRE-TRAINING COURSE for candidates wishing to qualify for trades training was begun on April 16, with some 10 persons in attendance. The course, a trial venture, will be completed in time to enable the successful candidates to enter a trades course this fall at the Moncton Technical Institute. This pre-training course is being sponsored under Schedule R and through the cooperation of the Rehabilitation services of the New Brunswick Department of Health and Social Services, under Mr. Crandlemire, Rehabilitation Coordinator; the New Brunswick Department of Education and the New Brunswick Department of Labour.

Association News

THE SASKATCHEWAN BRANCH of the Canadian Public Health Association held the second annual meeting in Regina April 3 and 4, with a record registration of 262 to hear the three symposia on how to develop health services for the future.

The first symposium on the theme of future health services was keynoted by Dr. M. I. Roemer, director of medical and hospital services for the provincial health department. Dr. Roemer said that likely within 10 years all Canadians would enjoy the benefits of socially financed hospital care services. Quality and quantity of hospital and other health services could be raised only by allocating a higher proportion of the national economic wealth to these services. This would involve careful planning. Such planning would have highly beneficial effects. "Public supervision, when intelligently applied, tends to raise the level of performance of the many institutions which, in any country, might fall below a certain standard," he said. Dr. Roemer believed the complexity of health service organization to meet all needs "will become so great that the public health agency of the future will probably be vested with a coordinating authority wider than any it now possesses. Local health jurisdictions . . . will encompass all aspects of medical, hospital, and related services provided by way of social action."

How to best train health workers was discussed in the second symposium by J. Wendall Macleod, dean of the college of medicine at the University of Saskatchewan. Dr. Macleod said the main feature in the health field today was the increasing specialization growing out of new scientific knowledge and medical technology. In this there is a tendency to depersonalization, both of service and the sick individual. Moreover, there is a tendency to disassociate the sick individual from his family, his job, and his environment. Deliberate planning was necessary in training the nurse and the medical student to combat these tendencies.

Prepayment of medical care was having an important effect in developing an awareness by students of the "whole person" in a hospital bed. It removed the stigma of indigency from patients in teaching hospitals and necessitated a display of the utmost in courtesy and consideration. Introducing practical or clinical illustrations during basic training was another effective device; so also was the practice of working preventive and rehabilitative aspects of a disease worked into regular clinical discussions.

In the final symposium, problems concerning the development of preventive services in hospitals were raised by Mr. Andrew Pattullo of the W. K. Kellogg Foundation's division of hospitals. Mr. Pattullo foresaw an extension of hospital services into the home and a merger of public health organization with hospitals. These steps he considered as necessary developments towards solving many pressing problems in the community.

He felt more attention must be paid by

hospitals to preventive health in particular. Hospitals have lagged in social progress while concentrating on scientific advances. The delegates also heard Professor W. B. Baker, Chairman of the Saskatchewan Royal Commission on Agriculture and Rural Life, explain how, in the light of lags in rural social organization, the extension of prepaid health services was helping bring rural levels of these services to what was enjoyed by urban residents.

A resolution was passed unanimously authorizing the executive to make an award to the hospital offering the greatest contribution towards stimulating concord between curative and preventive disciplines in the health field. The association also resolved to request that federal proposals for health insurance should include provision for hospitalization of the mentally ill and the tuberculosis patients. The Saskatchewan government is to be asked to proceed with a plan to provide full-time public health services for the entire province by encouraging the establishment of health regions in areas not yet organized. The delegates passed a resolution that these public health services should have priority over all other health services and that public education and organization for this purpose should be instituted in advance of the holding of popular votes.

Regarding the shortage of dentists in Saskatchewan as elsewhere, the Canadian Public Health Association Saskatchewan branch resolved to call attention to universities to the need for expanded dental education facilities.

In view of the need to integrate medical, nursing, and administrative techniques, a recommendation will be made to the provincial government that in future the chronic sick be accommodated in additional divisions or departments at general hospitals rather than in independent, isolated institutions. The Canadian Public Health Association branch also passed a resolution to press upon schools of public health and other training establishments the importance of widening the preparation of health workers for the leadership demands of a comprehensive modern health program.

Members of the executive for 1956–57 are G. W. Myers, executive director of the Saskatchewan Hospital Services Plan; Mrs. M. L. Hargreaves, executive director of the Saskatchewan division, Canadian Arthritis and Rheumatism Society; Dr. M. K. Dehnel, medical health officer for Regina Rural Health Region; E. L. Abbott, assistant director of health education; Dr. D. E. Rodger, internist, Regina; Louise Miner, field Supervisor in the provincial division of public health nursing services; Dr. Hugh E. Robertson, director of the provincial laboratories, all of Regina; Dr. V. L. Matthews, medical health officer for Swift Current Health Region; and T. A. Hart, senior sanitary officer, Weyburn–Estevan Health Region.

The new president of the Saskatchewan branch is Miss Hester Lusted, professor of public health nursing, University of Saskatchewan, who succeeds Dr. A. E. Chegwin, director of dental services in the provincial health department. The Honourable T. J. Bentley, minister of public health, was re-elected honorary president, and Dr. Irial Gogan, director of hospital administration and standards in the provincial health department, was elected vice-president. Dr. M. S. Acker, director of research and statistics in the department, was re-elected secretary-treasurer.

MANITOBA PUBLIC HEALTH ASSOCIATION held its spring general meeting April 6, with a gratifying increase in membership in the association from 68 to 104.

During the one-day session Dr. M. R. Elliott, D.P.H., Deputy Minister of Health, reviewed the federal proposals for health insurance and Dr. R. J. Walton, Director of Medical Services, Cancer Institute, spoke on ionizing radiation in medicine.

The meeting featured a discussion on the training of restaurant personnel by a panel including representatives of public health sanitation, nutrition and the Manitoba Restaurant Association. The panelists were in agreement that a course of instruction for food handlers would be advantageous but felt that such a program would have to include all persons involved in the handling of food in public places and therefore would require further study. The majority were not in favor of legislation making the course compulsory. A more definite opinion on the matter may be forthcoming from the annual meeting next fall.

Books and Reports Reviewed

Public Health: Its Promise for the Future.
By Wilson G. Smillie, A.B., M.D., D.P.H. Sc.D. (Hon.): Macmillan Company, New York. 501 pages, $7.00 in Canada.

THIS BOOK IS A CHRONICLE of the development of public health in the United States during the period of 1607–1914. It is not a history. In Dr. Smillie's words "When a man has devoted his entire professional career to a single phase of human advancement, he cannot present the subject objectively. For public health is a service to mankind to which one dedicates his life . . . thus, a book of this type cannot be written dispassionately, for it is, in truth, a justification of one's way of life." It is however, a chronicle and records effectively public health progress. The book closes with the year 1914. In that year Dr. Smillie entered the field of public health and in the preface he states that "no one who has been active in a given social or scientific field is in a position to judge and evaluate the historical worth of the work of his contemporaries, nor to appraise the results of their efforts." The story of public health is presented in three sections,—The Colonial Period—1600–1790, The Pioneer Period—1790–1861, The Period of Development—the Civil War to World War I. Medical officers of health and other public health personnel will find this book inspiring and highly informative,—a book to which they will refer many times.

Modern Nutrition in Health and Disease.
Edited by Michael G. Wohl, M.D., and Robert S. Goodhart, M.D.: Lea & Febiger, Philadelphia. 1062 pages. Macmillan Company of Canada. $18.50.

THE OBJECT OF THE BOOK is to present an authoritative and up to date discussion of every aspect of nutrition and provide the practicing physician and the student of medicine with a sound knowledge of both current advances and the practical application of that science. The book is divided into three parts, Normal Nutrition, Nutrition in Disease and Nutrition in Periods of Physiologic Stress. The approach throughout has been to the clinical point of view. More than fifty authorities in their fields have contributed in making this textbook outstanding. It is eminently suitable for the inclusion in libraries of health departments. Medical officers of health will welcome this important new text on nutrition.

Manual—Casualty Simulation
Published for Civil Defence Health Services by Information Services Division, Department of National Health and Welfare.

KNOWLEDGE OF MEDICAL AND NURSING consultants has been pooled with the experience of make-up artists, first-aiders, scientific photographers and typographers to produce a colourful government textbook on emergency treatment of victims of mass disasters. Their combined skills have been incorporated in a federal civil defence manual on "Casualty Simulation", which has been published by the Department of National Health and Welfare under its responsibility for the promotion and co-ordination of Canada's preparedness measures. Consultation with medical and nursing personnel ensured the authentic production of the various types of casualties which would be encountered in a wartime or peacetime catastrophe. Canada's book uses all the devices of colour, layout, acting and staging to achieve true-to-life effects. The civil defence volunteer, in common with the majority of our people, has been held immune from the scenes of horror accompanying large scale disaster or war. His training, in whatever civil defence service he is enrolled, must include some elements of realism in order that the shock of unaccustomed sights will not destroy his efficiency in a crisis.

The manual is not for indiscriminate distribution, and except for copies to persons trained in this skill through civil defence auspices, key people in professions and those organizations directly concerned with Civil Defence Health Services, is obtainable only from the office of the Queen's Printer, Ottawa, at a price of $1 per copy.